

BULLETIN  
OF THE  
AMERICAN GEOGRAPHICAL SOCIETY

---

Vol. XXI

1889

No. 1

---

A RESIDENCE AMONG THE NATIVES OF  
AUSTRALIA.

BY

CARL LUMHOLTZ, M.A.

ACADEMY OF SCIENCES, CHRISTIANIA.

During my four years' stay, from 1880 to 1884, in Australia, where I was sent by the University of Christiania to study the fauna and the aborigines of that continent, I had the opportunity of living for about twelve months among the cannibals in the northeastern district of Queensland, very often in parts where no white man had ever before put his foot. It is chiefly about my experience among these people that I intend to tell you to-night, but I must necessarily trouble you with a short introduction about the country itself, its scenery, its vegetation and its climate.

In Europe people seem to have very vague ideas about Australia and life out there. I recollect once being asked in Norway, my native country, whether forks and knives were used in Australia. Such a question alone shows how little people really know about that part of the world. They have no idea of the

wealth, the advanced state of civilization and the luxury to be found in the southern part of that continent. Australia is, above all, the land of minerals and pastures. I need hardly refer to its enormous amount of gold and to its millions of sheep and cattle, which supply the markets of the world. In the South you can get whatever you may want to make your life comfortable. Ladies have their dresses made in London and Paris. I remember having once at a race-course seen a lady with a dress that was said to cost £1000. But the farther north and the farther west we go, the more we get away from civilization, till, at last, we meet the lowest and most degraded type of humanity—a people in the most primitive and savage state of life—a people whose highest conception of numbers does not extend beyond 5.

You may compare Australia with a gigantic dinner-plate. The interior is a flat country of medium height (300 to 2,150 feet), rising towards the border. The edge of the "plate" is highest in the S. E., where, in the Mount Kosziusko Range, Mount Townsend rises to 7,059 feet above the level of the sea. Very distinct is the edge of the "plate" along the eastern coast, where stretches a continuous, although not very high, mountainous country, from Victoria through the eastern part of New South Wales and Queensland into the York peninsula, which bounds the great Carpentarian Gulf towards the East. The whole mountain district is by the Australian geographers (*e. g.* G. Sutherland,) called by the common name of the "Great Dividing Range." The single parts of this mountain ridge have different names, *e. g.* the Australian Alps, where Vic-

toria and New South Wales meet together, and the Blue Mountains west of Sydney.

Round the lower part of the Carpentarian Gulf and in a part of the southern district of Australia the "edge of the plate" is broken, and low and flat country here stretches from the sea far into the interior. On the other side rises from the "bottom of the plate" in Central Australia some higher land, which, however, nowhere so far as is known reaches 3000 feet.

This Dividing Range stretches along the eastern coast of Australia at a distance of from 50 to some 300 miles inland. It forms, as a rule, the watershed between the eastern and western waters, but there are chains of mountains visible from the coast that often are of greater elevation than the range itself, such as the above-mentioned Blue Mountains, where the streams, on their way to the Pacific, break through the mountains in picturesque chasms. The Dividing Range is sometimes not very easily traced. The spurs coming from it, as well as detached mountains near the coast, are often much higher and are frequently taken for the main range. This range, by throwing off rain and creating streams, has made the eastern part of Australia far more fertile than the western.

Layers from the coal period have a great extension in Queensland, and the northeastern part of New South Wales; so Australia, besides her other mineral wealth, possesses also the "black diamonds." In several places strata from the mesozoic period of the earth's history have been traced.

The remains of animal and vegetable life found in the older strata agree as a whole with those found in other

parts of the world from the same periods. Once, however, during the mesozoic time, Australia must have been isolated as a continent by itself. This plainly appears during the tertiary period; during this, most part of Australia seems to have remained an independent continent. This also was the case during the quaternary period or the geological present time.

Australia has no active volcanoes, but extinct ones are found in several places. Some of those that are to be found in Victoria must be considered to have had eruptions not long before the historical time.

This "Land of the Dawning," which, generally speaking, remains now as it was during the tertiary period, shows a corresponding primitive and peculiar fauna, as well as flora, with its proteacea, leafless casuarina-trees and acacias, which remind you of the extinct vegetation of the older tertiary period. The greater part of the Australian mammals consist of the curious marsupials which belong to the oldest and lowest organized of all known mammals, and which have, without doubt, remained from an earlier geological period, during which they also lived in Europe. Here are also found the two most remarkable mammals on the globe: the duck-bill (*ornithorhynchus anatinus*) and the spiny anteater (*echidna*), which, it has lately been proved, lay eggs and afterwards suckle the young. Among the birds, the country has some peculiar species (*megapodidae*), the only ones upon the earth, which do not themselves hatch their eggs, but, like the reptiles, bury them in hot sand or in hills of earth, the fermenting ingredients of which, by producing heat, hatch the eggs.

The class of mammals gives the Australian fauna its



characteristic appearance. Imagine a continent almost of the size of Europe without any mammals, except marsupials, besides some bats, rats and mice. There are none of those species from which our domestic animals have been developed.

The marsupials appear in some parts of Australia in countless numbers, and are very destructive to the grass. From 1880 to 1885 the Government of Queensland paid premiums for five million heads of the larger marsupials.

I undertook two journeys of importance during my stay in Australia. The first one was to the interior of Queensland, from Rockhampton, under the Tropic of Capricorn, about 800 miles west. Near the coast the climate is naturally more moist and the landscape sometimes even approaching to the picturesque. But as a rule the Australian landscape is more grotesque than beautiful, and it has a marked look of melancholy about it. The farther you go west the more does the whole scenery assume a dry aspect. In western Queensland they think nothing of it if they have no rain for eight or ten months. The grass is gray almost all the year round, but still this undulating country, the so-called downs, forms splendid pastures for hundreds of thousands of sheep and cattle; and the squatters store the rain-water in dams, and thus preserve it for one and even two years. Western Queensland, near Diamantina River, is one of the hottest places in the whole of Australia, the thermometer having registered  $125^{\circ}$  in the shade for three consecutive days. The air is so dry that perspiration is not felt. The soil is a rich, chocolate-colored deposit of clay, and it is a general belief that the large western country will in a short time, by means

of artificial irrigation, become a great wheat-producing country. Artesian wells have recently been bored in several places. In 1887, *e. g.*, water as clear as crystal and perfectly fresh was struck at a depth of 690 fathoms. In the 10-inch pipe it rushed up like a fountain, throwing up water at an estimate of 200,000 gallons a day. This was about 500 miles from the coast.

The other and by far the most interesting journey was to the delightful tropical regions of Northern Queensland.

In Northern Queensland the Dividing Range attains a height of 2,400 feet, and in consequence of the heat and moist climate the mountains are covered with dense brushwood—which the Australians call scrub—of enormous extent and great luxuriance,—a complete contrast to the ordinary Australian landscape, with its monotonous plains and its melancholy white-stemmed gum-trees (*eucalyptus*) and acacias scattered here and there. There are all sorts of trees and bushes in astounding number. Most noticeable is the Australian vine (*Calamus Australis*), twining along the trees, for hundreds of feet, through the forest, and sometimes rising in gigantic coils that make all passage impossible. One species of palm the colonists call by the not very poetic name of "Lawyer palm," because its sharp thorns tear one's clothes and draw blood from the skin. No less unpleasant is a huge stinging-nettle (*Laportea moroides*), whose beautiful heart-shaped leaves sting painfully. So poisonous are these leaves that their mere movement produces sneezing; whilst any one stung by them soon experiences an acute pain all up the arm as far as the lymphatic glands in the arm-pit. This is followed by dis-

turbed sleep at night, but no further unpleasant effects worth mentioning supervene. The antidote to this plant is, strange to say, always found in its immediate vicinity, in the same way as the kusso plant is found in Abyssinia, the native country of the tape-worm. That antidote is the sap of the *Colocasia macrorhiza*. Besides these troublesome plants, a large number of very useful and beautiful ones are met with in these regions, such as the fan-palm, the common Australian palm, the banana, etc. In the higher mountain regions, the gigantic tree-ferns grow in great splendor, their huge leaves broadening out over the transparent water of the brooks that trickle at their feet.

The water-supply of these mountain regions contrasts very strongly with the dryness of the Australian soil elsewhere. Here are any number of brooks, that now run into the most beautiful waterfalls, now flow into stately rivers. These rivers have, of necessity, a comparatively short course, but they carry for the most part a vast volume of water and they are accompanied by a dense undergrowth of jungle that extends to their very mouth. The soil in this region—along the rivers—is generally of incomparable fertility, and if the undergrowth is rooted up by the white settler, or more accurately, by his dependents, the Kanakas, the sugar-cane does wonderfully well. Tobacco and coffee also thrive well in this moist climate; only thus far, the right sort of tobacco to cultivate has not yet been found. In like manner, the cinchona plant, rice, arrow-root, everywhere thrive well in this region, but none of these plants is as yet cultivated, except on a very small scale.

The white settlers remain in the lowlands and never go up into the thickets of the mountain districts. Here, in natural conditions as yet unchanged, dwell the black aborigines, whom no white man cares to disturb. For they can find him neither gold, nor diamonds, nor anything else that would tempt him to encounter the difficulties of a journey to their haunts. I had, however, long wished to study these savages, the Australian aborigines, the lowest of the human race, in their actual conditions of life. For the ethnological student no phase of human life is as interesting as the most primitive one. And as you can get no reliable knowledge of a people except by living among them, so I made up my mind to live with the savages in their huts. A further inducement to risk the dangers connected with such a stay was my belief that by their help I could get many specimens of Australian fauna, which I should in no other way be able to procure.

Of course, I could not at once go and live with them, but had to work my way gradually. I had, then, been in Australia more than a year and, of course, had acquired some experience as to how to proceed with them. I first began to associate with the so-called civilized blacks, and through them, by degrees, became acquainted with other tribes, until at last, I lived with natives who were in the most primitive state of life and had never come into contact with a white man. By civilized blacks we generally understand such of the natives as have to some degree been affected by European culture; but the extent of their civilization may be briefly summed up thus—that a civilized black knows he will be shot dead if he kills a European, is

greatly addicted to tobacco, and is fond of wearing clothes which he considers more as an ornament than as a useful article.

The natives living around my headquarters at Herbert Vale had, during the last couple of years, commenced to visit the station every now and then, and thus they rightly deserved the name of civilized, although scarcely any of them possessed a single article of dress. Especially would they crowd into the station when old Walters, the keeper of the station-houses, and Nelly, an aboriginal girl who served us as cook, had killed a bullock. The bones and the intestines used to be their share, and this offal of civilization was considered such a delicacy, that they caught it eagerly with teeth and hands, and the possession of these valuable leavings was not decided without a general fight.

I followed these so-called civilized natives on their hunting expeditions, witnessed their fights and their dances, and grew familiar with their language and customs, until I found that I could venture further into the country and meet the more savage tribes. I therefore undertook several expeditions from my headquarters. The greatest trouble was to get the blacks to take part in my excursions; for they are born idlers and have a fundamental objection to any kind of work. Luckily, in the last six or seven months of my stay in that region I happened to find a really good servant. He stuck to me, wherever I went, so that my position, from the time of his advent, grew much more favorable. He was by no means an ordinary black, but was possessed of a peculiar vein of *naïveté*, and so he often blurted out ideas and information of the greatest value.

In spite of this he was not at all free from the treachery characteristic of all the natives. Nevertheless, he was better than the others, and saved my life many a time. Of course, I dared not trust myself to him unreservedly, for all blacks are like children, the sport of caprice and the inspiration of the moment, and are especially prone to deceit. The pair of us were fortunate enough to find, as a rule, four or five of the blacks willing to go with us; sometimes a whole tribe, with its women and children.

As far as this method was possible I rode alone, whilst my blacks went on in front, one of them leading my pack-horse. At the foot of the mountains a camp was pitched, and here the horses were left behind, whilst the saddles and bridles were placed in a tree, so that the wild dogs should not get at them. Then we went up the mountain on foot—the dense underwood there, of course, being impassable for horses. My provisions consisted of fourteen or fifteen pieces of ox-flesh, pickled and dried, with a small quantity of wheat flour to be baked into bread in the hot ashes, and some sugar. When these provisions were exhausted, which occurred pretty quickly, we lived, like the aborigines, on young snakes, lizards, larvæ, eggs, and the like. My outfit included a large, white, woollen blanket that was a standing wonder and a constant envy of the blacks. As soon as I unpacked it they made a clicking noise, expressive of delight, with their tongues, and roared out, "Tamin, tamin" (fat, fat)! Anything that is very good they call "fat."

One of the most important things I brought with me was tobacco, a greater joy to the aborigines than the

very best food. At Herbert River the blacks did not know, before the arrival of the whites, of any stimulants at all. The tobacco served me instead of money, and for it they would do anything, even to selling their wives. Among these people tobacco is always smoked, never chewed, and I have often seen a mother, carrying a child on her back, hand it a pipe, at which the child would take a couple of puffs with apparent delight. They often used to send, in barter, small bits of tobacco, wrapped up in gum, to other tribes, and in that way tobacco is known among remote tribes who have never themselves come into contact with Europeans. Next to tobacco, my revolver was of the greatest importance to me. Very luckily the natives, who do not themselves possess even bows and arrows, have the greatest respect for fire-arms. It is, however, necessary to keep up your reputation as a good marksman, else you will soon lose their respect. Their astonishment is equally great when you hit a kangaroo in a resting position, or when you bring down a bird on the wing. They were especially afraid of my revolver, which they looked upon as inexhaustible. I made it my business to keep this fear constantly awake, and every night before creeping into my hut, I discharged the "baby-gun," as they called it, just in order to refresh their minds as to the existence of this dreadful weapon.

In the evenings, just before sunset, we pitched our camp and settled down for the night. I had a hut made by the natives every evening in their ordinary way. The huts are built in a few minutes and consist of palm-leaves stretched across a slight frame-work of boughs. They are about three to four feet high and have a large

opening on one side. I always had my hut made so long that I could lie down at full length, but the natives I generally found lying two to three closely huddled together with their feet projecting outside.

Happily for me I felt in the winter-time the cold at night, owing to the great contrast with the heat of the day-time, and in consequence I awoke several times every night and had to wake the blacks to keep the fire burning before our huts. This gave my men the impression that the white man slept but little and that he was always on the alert and had the baby-gun ready. It was necessary always to be on one's guard, as the blacks are of a very treacherous and cunning nature, and one of the most important precautions that a colonist learns to take, is, "never have a black fellow behind you." The natives never seem to lose their inherited impulses, as the following experience of a squatter on Thomson River will show. He had, one day, gone shooting with his black boy, and as he was walking through the forest in front of his servant, the latter clapped him on the shoulder and said: "Let me go in front of you and shoot; behind I feel too great a longing to kill you."

I had a good deal of unpleasantness and many troubles through their deceit and cunning, which often made me so tired and worried that I was on the point of giving up the expedition, but the thought of perhaps being able to make valuable discoveries in this strange and interesting country always kept my spirits up, and I must say that I was not disappointed, but have returned with interesting facts and specimens of natural history, new to science, and with an intimate knowledge of the life and habits of the Australian aborigines,—one of



those unfortunate races that are rapidly dying out. On the other hand I was cheered in my work by the many delightful impressions I received of the grand and splendid scenery around me on my wanderings, sights I shall never forget. When the tropical sun rose in the early morning above the lofty trees of the Australian forest and awakened nature with its bright, dazzling rays, or when the moon appeared above the mountain ridge and threw her pale light over the vast plains below, while the mystic voice of the night-birds rang out on the still atmosphere, there was a beauty over the landscape to which I could not possibly do justice if I were to attempt to describe it.

The Australian aborigines are generally called blacks, but their color is really chocolate-brown, which can be seen best when they go into the water. In the summer-time they dive down into every pond they meet on their way, not from any love of cleanliness, but to cool themselves off. In the winter they never bathe. Newly-born children are yellowish-brown, and rapidly turn darker as they grow older; those of two or three years are as dark of hue as the adults.

On the coast they are of rather small stature, but in the interior of medium size and sometimes even very tall. One man who was well known among the whites near Mulgen, in Central Queensland, attained a height of 7 feet. The aborigines are much less muscular than the Europeans, especially in the calf of the leg. Their bodily strength is, in consequence, decidedly less; yet they have an extraordinary command over their frames and they move with much dignity and grace. Their women have the pose and movements of ladies. The

whole build of an Australian is notably fine and finished, I had almost said elegant. One of their most striking features is the low forehead and the strongly marked projection above the eyes, pointing to the fact that their powers of perception are good. All evidence leads to the same conclusion. Their eyes are always dark, with the whites of a dirty yellowish hue and with the capillaries very marked, a peculiarity that gives to the face a wild look. The nose is flat and triangular, very narrow above, so that the eyes are placed very close together.

The fleshy nasal partition between the two nose-cavities (*septum*) is exceptionally strongly developed. The aborigines often perforate it and stick through it a peg as an ornament. My companions who, of course, had neither pockets nor pipe cases, were in some difficulty as to where they could best keep the clay pipes I had given them, but they soon found a safe place for their pipes by putting them, instead of the peg, through the hole in their nose.

Sometimes I came across men with almost Roman noses, and you might believe, especially in Northern Queensland, that an interbreeding had occurred with Papuans, who, as is well known, are very proud of their big noses. The cheekbones are very prominent; the mouth is large, open, and in many cases anything but beautiful. The teeth are white, regular and very powerful, but on account of the coarse food and from being used for many purposes for which a white man would not think of using his teeth, *e. g.*, biting off tough and thick branches, making tools, etc., they grow at last very sore and are worn down to the gums. The chin is tolerably short.

Hair and beard are jet-black ; the hair is not woolly but more or less wavy. Occasionally it is quite straight, but on the Herbert River this was a rare and exceptional case. When their hair begins to be troublesome to them by reason of its length, the blacks take a lighted brand from the fire and simply burn it off. Once at my headquarters I saw a young man cutting his hair with a blunt axe he had borrowed. Fragments of glass are used for the same purpose. Men and women wear their hair of equal length.

As a rule, they are an ugly race, but now and then really good-looking individuals occur, more especially among the men, who, in general, have better figures than the women. Yet even among the latter I have sometimes seen what I should call "black beauties."

Their hands were small, their feet dainty and well-shaped, and their insteps so high that one would involuntarily ask where in the world they could have acquired this distinctive mark of aristocratic descent. Sometimes the young women have excellent figures; their skin is as delicate as velvet. When those black daughters of Eve laugh, showing their incomparable white teeth, and cast coquettish glances from under their wavy hair, hanging in quite the modern fashion over their brows, it may be understood that these women are not quite deprived of that influence ascribed by Goethe to the fair sex generally. They age very early, though. And I must confess I can hardly imagine any human being more ugly than these old women, crouching over the fire and rubbing their bony limbs. They seem to have no muscles left; their stomachs are prominent, their skin wrinkled, their hair

grey and thin, their faces unusually ugly, so much lie more as their eyes have almost disappeared. I often wondered why the men did not kill these old women who, I thought, were a great trouble to them, for I had seen that the Australian aborigines made short work with anything that gave them trouble or worry, but later I learned that the old women are rather useful than otherwise to the tribe. They are very clever in finding food, and not only do they support themselves and the weaker members of their sex, but I have also observed that they gave food to young men who were too lazy to find any for themselves.

The sense-organs of the aborigines are well-developed, and their sight especially is unusually acute. They can see, at a height of sixty feet or more, the Australian bees, which are smaller than our domestic flies, enter their nests in the trees. They can also stand the vertical sunlight much better than we. If an Australian black is digging any animal out of the ground, a handful of the soil held to his nose is enough to tell him if the animal he is in search of is at home or not. When he is going through the woods, he will take up, as he passes along, a handful of earth or a leaf in order to tell by the smell if any animal has passed that way.

The Australian aborigines are a healthy race and not very subject to disease, except in cases where they have become "civilized"—have taken to clothes—when disease begins among them. The Australian who, on the Herbert River, goes abroad quite unclothed, is, as I have already said, very proud of the possession of garments. But he regards them only as ornaments, and

takes them off when they are most needed. I have seen Australian natives, in the greatest heat of summer, sweating in woollen jackets, while in the cold nights they will be sure to take them off. As a consequence, colds and chest complaints result. But I have never seen a black catch cold as long as he was living in his natural conditions. Climatic fevers are just as rare among them. I only saw one native down with fever, and he was "civilized"—wore clothes, caught cold to start with, and then took fever.

The Herbert River blacks use no kind of medicine. The only thing they will sometimes do is to suck the blood from the part in pain, or to smear it over with their saliva.

Toothache occurs now and then among these people. If it is a back-tooth that is giving pain, the patient gets another black to suck blood from his cheek, much as we use leeches. If it is a front-tooth a very radical cure is sometimes employed. A sharpened piece of wood is placed against the tooth, another fellow strikes it, and the tooth is knocked out.

The aborigines are not so sensitive to pain as we, but they give in much quicker. If one of them gets ever so slight a cut on one of his toes, he is at once a universal object of commiseration, and keeps at home in camp.

In my opinion the men live to a little over fifty, an age rarely attained by the women on account of the hard life they have to lead.

Like all savage people the Australians are much given to the adornment and painting of their bodies. Sometimes, especially at their dances and fights, they

besmear their whole body with red or yellow earth, or with powdered charcoal and fat, as if they were not black enough already. They also use cicatrices, or the scarring of their flesh, as an adornment for their bodies. For this purpose they make use of a sharp stone or a mussel-shell, with which they cut deep parallel lines all over their chest and abdomen. To prevent these wounds from healing, they sprinkle powdered charcoal or ashes into them, or sometimes they let ants run about in the wound, the result being that the lines will swell up in ridges as thick as a finger. This kind of ornamentation they consider very beautiful, and it is also indicative of a certain rank dependent upon the age. A little boy has no marks. In due time he is marked with lines. The number of these markings is increased as he grows older, and a crescentic line, with the points bent outwards, is drawn around the nipple. Only the men are thus decorated with marks of rank, while the women have some clumsy markings upon their breast and arms for decoration. Tattooing, as it is generally understood, by puncture of the skin with a pointed tool, is not employed by the Australians.

The languages of the natives of Australia are as various and numerous as the tribes into which they are divided, although upon a closer examination, it appears that all these languages are in some measure related to each other so that they may properly be styled dialects derived from one common source. Thus, for instance, the word for *eye*, "mill," has a very similar form all over the continent, and the same is the case with the word for *two*. As yet no definite kinship between this Australian language and any language outside of Aus-

tralia has been proved, although the theory has recently been advanced and supported by an apparent similarity in words and also in customs and superstitions, that in spite of difference in appearance, there exists some kinship between the African and the Australian negroes. Of a written language there is no trace, unless the message sticks by which they communicate one with another can be counted under this head. It has been stated that the Australians cannot pronounce the letter *s*. This is inaccurate. On the Herbert River, for instance, the word for tobacco (*soottoongo*), has an *s*-sound. The dialects of the Australian blacks are polysyllabic, and the accent is generally on the second or third syllable from the end. They have a by no means unpleasant sound, many words being notably musical, a music to which the abundance of vowels contributes. As to consonants, the gutturals predominate. In many cases a most imperative brevity is noticeable; a whole sentence often is condensed into one word. "Will you go with me?" is "*Nginta*," which in reality only means *you*, while a gesture completes the sentence. To this the answer is: "*Ngipa mittago*," meaning "I will go home"—literally, however, it means "I with respect to the hut."

This suffix "go," in order to avoid an extensive grammar, is much used, and is added to verbs for the purpose of inflecting them. On the Herbert River the aborigines have words for the three first numbers—*yongool*, *yackan*, *carbo*. Number four and all the others are to them *taggin*, *i. e.*, many. Their vocabulary is very limited. They have no general names, like *tree*, *bird*, *fish*, etc., but every single species has its own



name. Curiously enough they have words not only for the animals and plants, of which they make use themselves, but also for those for which they have no use or interest at all.

As they do not cultivate the ground and keep no domestic animals, they naturally do not want many implements. One of the most important is a long stick, which the women use for digging up roots, grubs, etc., and a stone or iron axe, which, of course, is also used as a weapon. They are clever with their fingers. Some strong and beautifully made baskets for carrying fruit, etc., are made by the men. Besides the axe or tomahawk, their weapons consist of spears, clubs, great wooden swords, shields, etc., but the most remarkable is the well-known boomerang. There are two kinds of boomerang, one, the returning, used only for amusement, while the other, that does not return, is used for killing game and in warfare. It has been asserted that the Egyptians and the Assyrians knew the boomerang, and the conclusion has been drawn that the Australians descended from a more developed race than the present one. It is, however, rather doubtful whether the Egyptian or Dravidian boomerang was the same as the Australian.

The low state of civilization of the Australian native is easily understood from a look at his weapons and implements. Most of them are wooden. At Herbert River the natives almost exclusively use spears in hunting, but when they are walking around in the extensive and thick brushwoods, they, as a rule, move about perfectly unarmed. If they get a glimpse of any animal, they break off a stick, and try to kill it by throwing at



it. Herein, as a rule, they succeed, as most of the animals live in the trees, and have a great difficulty in escaping when the natives from several sides climb up and encircle them. If an animal has been killed and is going to be prepared, the belly is opened with the first stone, or a suitable piece of hard wood, which may happen to be in the way. With a stone, or with their teeth, the men divide the prey among them. Their knives are flint-flakes, which they either find accidentally, or obtain by blasting a rock with fire and water, and in no case do they apply more work to them.

Thus, the Australian aborigines may be said still to be in the palæolithic state, and they must even in some respects be considered not to be above, or perhaps even below, the men of the quaternary period.

The food of the blacks on Herbert River is chiefly vegetarian, although most of the vegetables they use are, in their uncooked state, positively poisonous, and require the most complicated preparation by means of roasting, beating, and soaking in water before they are fit to be eaten. Besides this, they eat a deal of flesh-food, such as opossums, lizards, snakes, and other animals. But they eat nothing raw; everything is cooked—not, be it noted, in boiling water, but by roasting in the hot cinders or ashes. The greatest delicacies, such as human flesh and big snakes, are cooked by placing the food between hot stones and green leaves in earth-mounds, just as clams are often baked. The flesh of the large lizards is really good, something like chicken in appearance and taste, but that of snakes makes a dry and tasteless dish.

Most of the animals eaten live in the trees; and the

natives naturally grow very clever in climbing trees. Those around Herbert River excel, in this respect, all the other Australians that I have seen. Also the honey of the wild Australian bee that is found high up in the trees is a valued article of food, and the natives sometimes even feed on it for days. Sometimes the honey has undergone fermentation and becomes sour—something, however, that does not offend the appetite of the natives. I used this honey myself instead of sugar to mix in water, thus making my frugal meals more enjoyable. The honey, however, always caused me, and often the natives, diarrhœa; which, I think, is rather an interesting fact, as I can eat any quantity of the domesticated bees' honey with perfect safety. Both this indigestibility of the Australian honey and its fermentation are due to the fact that these wild bees have no poison and only a rudimentary sting, the poison of the domesticated bee serving to make the honey digestible as well as to preserve it against undergoing fermentation.

The eggs of the brush-turkey (*talegalla*) are among the great delicacies of the blacks. They are prepared in a practical manner by being placed in hot ashes, so that they cook in their shells. Frequently the eggs are addled, but this makes no difference whatever to the natives—on the contrary, they prefer these to the new-laid ones. The eggs are then eaten with the help of a piece of cane, the end of which is chewed till it resembles a brush.

The blacks have also a great predilection for eggs of ants, for grasshoppers, and especially for the larvæ of some large species of *coleoptera* that live in the stems

of decaying trees (particularly *euranassa Australis*), and frequently attain the length and breadth of a finger, of dazzling whiteness and very fat. The natives cut them out of the tree with the aid of a stick or an axe, and are so delighted at the find that they cannot resist swallowing a few of them alive. The rest are placed in baskets and baked in the ashes; they then become crisp. I convinced myself of their pleasant taste, and, strange as it may seem, I considered them a great delicacy, and certainly they formed the best food which the blacks could bring me. They are like an omelette, with a flavor of nuts.

When the natives come down to the grasslands, they are very fond of hunting wallabies by burning off the grass and spearing the animals.

I may also here mention an animal which I succeeded in finding, after three months' search, and which the natives also used for food—the tree kangaroo (*dendrolagus Lumholtzii*), one of the mammals new to science,—discovered by me during my stay in Australia. This animal is as big as a sheep and lives in the most inaccessible parts of the scrub-covered mountains, and is, therefore, very hard to get at.

The mutual relationship of the different tribes is still, on the whole, that of the lowest grade of the human race.

Among themselves they are kind and friendly, to such an extent, even, that they carry their sick members along with them on their expeditions and care for them, and this is really the only noble trait of their character I have been able to discover. To all outsiders they are, however, absolutely hostile, and woe to the black who should stray into the domain of another tribe. If he is

discovered, he is sure to be killed and eaten by his enemies. War still exists here in its original form, treacherous murder of single individuals and cowardly attacks from ambuscades upon small tribes. Never, at Herbert River, would a tribe dare to meet another in open fight.

It must also be mentioned that chiefs are never found among the blacks. Once or twice they asked me to lead their attacks upon other tribes; but this was only for the occasion, because they thought that my gun would be of good effect upon their enemies. On important occasions the elders of the tribes are consulted; occasionally, too, I saw them even take an old woman into their counsels. It is true she was very clever in procuring, with the aid of her husband, *talgoro* (human flesh); what wonder, then, that she was much looked up to! In other Australian tribes there are chiefs; sometimes even two, *e. g.*, near the Gulf of Carpentaria. But, it must be noted, the personal liberty is never interfered with; if a man wants to remain at home when the tribe starts for an expedition he is always free to do so.

One of the ways in which they settle their differences is by means of the so-called *borboby* (a tournament), where about 200 or 300 persons from different tribes meet and settle disputes, not only between the tribes, but also between the individuals. Three or four times each summer they meet for *borbobies*. Several pairs fight, at the same time, regular duels with wooden swords and shields. The old women play a great part at the *borbobies*, by their inciting the men with jumping in the air and their wild, deafening howls—three or four standing behind each of the combatants. As soon as one is suc-

cumbing they hold their sticks protectingly over him against the sword of the victor.

With the exception of murder of a member of the same tribe, the Australian native does not consider anything as a crime except theft. However, infringement of the property right of another is not punished by society, but is settled between the individuals. The robbed one challenges the thief to a fight with wooden sword and shield, and the settlement takes place now in private, the relatives of both parties serving as witnesses, now publicly at the *borboby*. Whoever wins the fight is held to be in the right.

To steal women, also among these savages thought to be man's most valuable property, is the grossest but also the most common theft; for it is the common way of getting a wife among the Australians. So the *bor-bobies* are almost entirely fights about women, of whom a great number change hands on such occasions.

The public dances also bring several tribes together, but these are all friendly. The dance is conducted by fourteen to sixteen men, in ranks of four or five men. They march up and down with contortions and movements of the body in perfect time, while the orchestra, consisting of one single man, sings its monotonous air, accompanied by the clattering sound of wooden weapons beaten against each other. Only one woman takes part in the dance, jumping up and down on the same spot all night long, her arms outstretched and her fingers spread apart, and this is for her a great honor, of which the other women are highly envious.

In their other social relations within the tribe they are all on the same level. The more wives a man has,

the richer he is, for the women do all the work and attend to everything. Generally speaking, the Australian has not more than two or three wives; in individual cases, however, I saw as many as five following one man. The woman is nothing but a slave, whom her master may ill-use or kill if he likes. There are three ways of obtaining a wife: either through the woman being made over to the man, as a living inheritance, or by being bartered for a sister or a daughter, and it is a curious sight to see an Australian black go about with his wife, whom he is bringing up as a father might his child; or again, the common way of obtaining a wife, which is by conquest. The best looking women are most fought for, and the strongest man, of course, comes off victorious in the end. The old men, as the most respected ones, are always surrounded by the prettiest and youngest wives, and the young men have great difficulties and have to wait for years for their turn.

Of the education of the children there is no trace. The little ones are left to themselves, and they are allowed to do just as they like. As soon as the boy can walk he begins to play with the boomerang, and to smoke tobacco, and very soon conducts himself like a grown-up man. In mind he does not differ much from his father, for the adult Australian is really but a child in thought and deed.

To return now to cannibalism, already referred to. When the blacks do not have to keep up appearances before the whites, they make no secret of their love for human flesh. As soon as they come in communication with white men they deny it, because they see the white man, whom they always want to imitate, abhorring

human flesh, and chaffing them for this custom ; by and by they leave off the cannibalism altogether. Moreover it must not be supposed that they indulge in human flesh every day. During my whole stay at Herbert River only two blacks were killed and eaten. One of them was a young man who had ventured into the territory of another tribe and was surprised there ; the other, an old man, was not able to escape quickly enough when his tribe was attacked ; he was beaten to death with stones, and his flesh was brought to Herbert Vale in baskets.

You must not imagine the cannibals more ugly and wild-looking than other savages. Certainly, the most daring and crafty ones go hunting for men, but a man-hunter may look very quiet and sociable. The meal is shared in by both men and women.

As a rule they do not eat any of their own tribe. I know of only two cases in which members of the tribe were partaken of, and in one of these a mother joined in devouring her own child, though Australian mothers are, on the whole, exceptionally gentle and kind to their little ones. In other parts of Australia, *e. g.*, near Moreton Bay, and south of the Gulf of Carpentaria, they eat the corpses of their relatives.

Generally an expedition of four or five men sets out for a man-hunt. A small tribe is watched for a long time from an ambush, and, as soon as they think themselves safe, the pursuers, some fine morning before day-break, set upon their victims, who never dream of offering any resistance. The men run away without troubling themselves about the women, who are left to make their escape the best way they can with their children.



The Australians do not like the flesh of the white man. It causes them nausea, they told me, as I learned when they had killed a white man near my headquarters and I asked them if they had eaten him. So, although during the latter part of my stay I was often in danger of being killed, I should never have been eaten, but my corpse it was their intention to leave in *ngallo*, i. e., in the river.

There is no religious idea connected with their cannibalism, but human flesh is the greatest delicacy known to them. The Australian, however, has the superstitious belief that by eating the fat around the kidneys, which they consider the centre of life, the strength of the dead man will be transmitted to themselves, and that by carrying a small piece of human fat, wrapped up in grass, upon their person, they will have luck in their hunting expeditions. Next to the kidneys the thighs are the most relished part of the human body, but they never eat the head.

As an example of the degraded condition of the Australian natives, I may here cite the following case that occurred in the neighborhood of Herbert Vale. A young lad, twenty years old, called Mangola Maggi, who had frequently accompanied me on my expeditions, and to whom I had offered some tobacco as a reward for the cranium of a black who had lately been killed in a *borboby*, brought me one day a skull. I immediately saw that the one he had brought was not that of a full-grown man, and that there was a large hole on the top of the skull. When I asked him what had caused the hole, he answered that the dingos had begun to gnaw the dead body. My people, however, declared, that it



was the skull of a black whom Mangola had killed some time before. He had asked an old man with two pretty young wives for one of them, and the old man naturally refused this request. This angered Mangola so, that to avenge himself on the old man, he slew his young son, ate him, and tried to earn some tobacco by selling the skull to me.

The Australians generally bury their dead, but they always try to avoid having the corpses come in contact with the earth, so they cover the body with bark or something similar. Pretty common is also the custom of placing the corpses between bark and leaves upon a platform, where they are kept until they are gone to decay, whereupon the bones are buried in the earth. A kind of mummies too is found in Australia, dried by fire and smoke; old warriors especially are treated in this way; and the bodies of male children are also prepared in this manner. The body is packed up into a parcel and borne around for some time, even up to six months, by the mother; she carries it along wherever she goes, and at night sleeps beside it.

They entertain a vivid fear of the spirits of their dead, particularly of those of high rank; the spirits of those dead long ago they do not fear. As a whole, these children of nature do not seem able to abstract the human soul from the body, upon the presence of which their ideas about a future life seem to depend.

Sorcerers are highly dreaded; whenever a man dies from sickness, they always ascribe it to witchcraft wrought upon them by a hostile tribe, and this superstition is very effective in upholding the hostility between the tribes.

It now only remains for me to give a brief account of their religious ideas. These are, to say the least, very limited. As every one knows, there is no trace of idol-worship among the Australians: nor has any one observed them praying or sacrificing; they confine themselves to fearing. At Herbert River they have not the faintest conception of a beneficent Supreme Being, but, on the other hand, they are afraid of an Evil Power, which may harm them; their ideas about this Evil Power are, however, extremely confused. Sometimes they see it embodied in a cicada, which, on summer evenings, makes an uncanny noise—a noise that seems to come one knows not whence. But the Evil Spirit especially manifests itself to them in a night-bird, called the Quingan. I must confess that I have never heard so dismal a voice in any bird as in this one; it always lurks in the most inaccessible mountain-districts, where it is difficult to get at it.

Of any sort of cult there are only the very faintest traces. Thus, boys when they attain manhood, are marked with two half-moon shaped marks on their breast. The wound is kept open and the scabs, before they peel off, are collected, placed in a very small basket, round his neck, and then carried into the forest and thrown away, as an offering to the Devil, evidently intended to appease his displeasure. Oddly enough, they are not, like other savage races, afraid of thunder and lightning. Of a future life they seem to have only a very vague conception. As I was once passing by a grave, over which a basket was hanging from a tree, I fancied I had come upon some dim idea of a future life; that this was perhaps a custom, as with the Indians,

who place food and drink for the departed spirit over the grave. However, I received a very simple explanation. The parents of the child who lay buried there had themselves hung up the basket, because the child had been very dear to them, and they hoped to forget their grief if only the basket, in which they had formerly carried about their little one, were out of their sight. One of the last times I was with the blacks, the full-moon rose in all her glory above the palm-wood. I asked the people in their own tongue "Who made that?" The answer was: "Other blacks." Then when I spoke to them of the sun, I received an identical answer. They are also firmly convinced that they can make rain (*milka*). When we were overtaken on any of our expeditions by one of the great tropical showers, they were invariably angered at the blacks who had sent the rain.

The missionaries have tried, particularly in the southern part of the country, to convert the blacks; with but little success, however, as they have had to combat not only the disinclination of the blacks, but also the opposition of the whites.

The blacks who have been educated outside of their tribes from their childhood may advance pretty far in civilization, and learn to read, write, count, and sing. They also very easily learn to play cards, even such a difficult game as euchre. They advance farthest in the kind of work that daily occurs at the stations. In the house the women are much used, and a couple of them are, as a rule, found at every station. They make very able waiters, but poor cooks. As shepherds and stock-men they are very capable, and sometimes excel the whites.

With their innate fondness for change they always go from one master to another, even if they have no objection to their employers.

The government of Queensland has for the protection of the colonists against the natives organized what is called "the native police." It consists of blacks from other parts of Australia, who are, of course, natural enemies of those against whom they are to be used. They are uniformed, and armed with guns, and are splendid horsemen. They are commanded by a white man, called sub-inspector, and a white sergeant. In the same degree that colonization advances, they are however done away with. They have, even up to the last year, committed many outrages upon the natives, and therefore this institution has become very unpopular.

Although the Australian may advance so far in civilization as described above, it is a characteristic fact that he never can get into an independent position. He never lays anything aside and does not know how to make money. He never learns to become a trader, and he retains, when civilized, the decided disinclination for farming so characteristic of him in his natural condition. Not even in the easily earned revenue of grazing does he understand his own interest. A living sheep is an impossibility in the camp of the blacks, not to mention that the gold of the country is only a stone for them, even if they see the greedy digger grow rich by the search of this precious metal.

"When civilized nations come into contact with barbarians, then the struggle is but short except when a dangerous climate helps the native race."

This statement of Darwin's is nowhere truer than of

the Australian blacks, whose days, so to say, are numbered. As civilization advances, their number dwindles day by day, in spite of the fact that the several governments at present do everything in their power to preserve them. When the Europeans first went to Victoria, according to one account, there were 9000 blacks, but now there are only some 750 under the protection of the Colonial Government. In the year 1881, the total number of aborigines in Australia was still about 31,700.

It would seem that the Australian blacks cannot live under civilization, and will not give up their old nomadic life. Truly, they adopt only the vices of civilized life, not its virtues and advantages. Moreover, it is only the roughest type of colonists with whom they first come into contact, and these are not likely to improve the natives in any way. They have taught the women to lead disorderly lives, and sterility is now almost universal among the more civilized tribes. In the coast districts they learn to drink brandy, while the Chinese supply them with opium. It is wonderful to see how rapidly these stimulants, especially the latter, make way with them. Occasionally, too, they are treated with the utmost cruelty by the whites—a cruelty sometimes justified by self-defence, but more often nothing but a wanton slaughter. The native police, too, has been a chief instrument in destroying the natives. It has not only killed great quantities of this unhappy people, but has also contributed greatly to their demoralization. Sometimes even arsenic has been put into their food by the settlers. Such atrocities committed upon the poor savages will ever remain a disgrace to humanity. The blacks in return commit outrages, too; and still, in

the civilized parts, oppose the invasion of the whites into their native country.

To civilization and Christianity the Australian aborigines have not proved susceptible, and to resist the advancing civilization is beyond their power ; they remain therefore without future, without home, without hope—a doomed people. The two races cannot exist together. If natives attack the whites or their cattle, they are shot dead ; if they try to be on friendly terms with the strangers, their destruction is no less certain. Taken all in all it is probable that within a few generations not a single Australian aboriginal will remain. Their fate will be that of the Tasmanians, the last of whom died some years ago ; for these feeble races must succumb to the inexorable law.







**MAP OF  
CARL LUMHOLTZ'  
TRAVELS IN AUSTRALIA.**

*From the Danish original.*

----- INDICATES ROUTE.  
BLACK SPOT—COUNTRY OF THE  
CANNIBALS.

The map shows the eastern coast of Australia, including the Gulf of Carpentaria, the Cape York Peninsula, and the Great Barrier Reef. Key locations marked include Trinity Bay, Rockingham B., Windchamber, Lagoon, HALIFAX BAY, Cleveland R., Townsville, Wickham, Edgemoor B., Mackay, Port Curtis, and HEAVY BAY. The map also shows the Great Barrier Reef, the Gulf of Carpentaria, and the Cape York Peninsula. The map is labeled with numerous place names and coordinates.

+++++ INDICATES ROUTE.  
BLACK SPOT—COUNTRY OF THE  
CANNIBALS.



# THE PORTUGUESE IN THE TRACK OF COLUMBUS (1493.)

BY

DR. P. J. J. VALENTINI.

## STORY OF THE EXPEDITION.

### II.

"Whoever finds this package and delivers it unopened to the Kings of Castile, will receive the sum of a thousand ducats."

Despairing of ever bringing his broken vessel through the raging storm and waves, a ship captain rolled a cask overboard, on February 14, 1493, far off from the Azore Islands. It concealed, in waxed cloth, a well fastened package with the above inscription, and this package contained the report of the discovery of great islands in the far west of the ocean.

A second cask with the like contents was fastened on the bowsprit of the ship as a further measure of precaution.\*

---

\* With regard to the events that happened between the 14th of February and the 14th of March, as they were drawn up in the following narration, we rely on two main sources of information. First, Columbus's journal of his first voyage, in *Navarrete, Coleccion de Viajes, Tom 1, pag. 1-166*. This text, presenting only a summary of Columbus's original, was made by Las Casas. Second, *Historie del Sig. Fern. Colombo ed. Milano, 1614*, where in Chap. 36, pages 150-153, the son reports his father's adventures during those tempestuous weeks. This text is of peculiar interest because it contains a verbal abstract from Columbus's original journal. The most interesting passage runs: "et di subito feci portarmi un gran

Whither the waves carried that first memorable document of the discovery of a New World, no one knows. But only three weeks later, we see the rescued man, Christopher Columbus, run into the Tagus River with a wreck and cast anchor at the *rastelo*, the Custom-House of the port of Lisbon, (March 4, 1893.)

For weeks the same storm had raged on the coasts of Portugal, and countless wrecks had floated to land. The river was alive with ships that were prevented from running out, and among them, it is related, was King Joam's new-built giant-ship,\* which loomed above the others like a floating fortress. Curious boats swarmed around the *Niña*. When she hoisted the Spanish flag, there was no longer any friendly glance of welcome in the eyes of the lookers-on.

Columbus's situation was painful, if not humiliating. Fleeing from the pressure of his creditors and perhaps still more from the ridicule of the learned men, who had condemned his problem laid before the King, he had nearly seven years before gone secretly across the border to find a better hearing from the King of Spain. How he at last succeeded in this, how he was raised to the rank of an Admiral, and was sent out into the Ocean with a fleet of discovery and with what fortunate news he turned back towards home—all this is well known. That fate should now have driven him to ask for help

---

Barile, et havendo involta la scrittura in una tela incerata, et messala appresso in una torta, o focaccia di cera, posila nel Barile, et ben serrato co' suoi cerchi lo gittai in Mare \* \* \* et feci un altro legaccio simile á quello, e lo accommodai nell' alto della Poppa, accioche, sommergendosi il Naviglio si manesse il Baril sopra le onde in arbitrio della fortuna."

\*A description of the Giant-Ship is given in Resende (Garcia de) Cronica del Rey Dom Joam, cap. 146.

from the very city in which his whole course of life was known, and where the multitude could point at him as a runaway and a traitor, must have been hard for him, and his feelings were expressed in the earliest official meetings.

On the following day\* a boat with armed harbor police came to his ship. The leader summoned Columbus to come down to him and to take a seat in the boat, that he might be registered on shore by the proper authorities. Columbus recognized the voice of the person that spoke to him. It was Bartolomeo Diaz, the discoverer of the southern cape of Africa. Ten years before both of these men had been dreaming of discoveries, and now the dreams of both were fulfilled. But one had been compelled to content himself with the post of watchman in a harbor for his recompense, while the other had been elevated to the rank of Admiral of the oceanic fleet of their Catholic Majesties. Columbus answered Bartolomeo briefly and with pride that, as Admiral of the Kings of Castile, he had no account to render to any foreigner with or without authority. He would leave his ship only when compelled to do so by force of arms. It was then suggested that, as he was not willing to go, he might send the first officer of the ship in his place. But this request also was refused. Columbus's answer was in a like tone of insulted pride. Neither he, nor any of his crew would set foot out of the ship. It was not the habit of the Admirals of Castile to surrender themselves or their men, even at the risk of their blood.

---

\**Navarrete C. de V.*, Tom I., pag. 162 and *Historie d. S. F. C.*, Chap. 40, pag. 163-167.

This allusion to the sailor's feeling of honor did not fail of its effect. If he were so determined, rejoined Bartolomeo, the matter might rest there. But in that case he could not help asking Columbus to give him personally a sight of his royal patent as admiral, to which he had appealed. To this request Columbus acceded. Bartolomeo went on board of the *Niña*, read the document shown to him, declared himself satisfied, and returned to the large custom-ship to report what had taken place. In accordance with ceremonial, the commandant of the port, Alvaro de Acunha, then appeared on Columbus's caravel, and amidst the noise of drums, fifes and trumpets, placed himself in the most polite manner at the disposal of the admiral for all further services.

Columbus escaped in this way a great danger. He had assured himself of the protection of the authorities, who now became the bearers of a letter which he addressed to King Joam. In it he begged the monarch, who was not then sojourning in his capital, but was at his country-seat of Val de Paraiso, for protection as "a shipwrecked guest and an admiral of the Spanish Crown." He further wrote that he did not come from Guinea or any other possession of his Portuguese Majesty; that he had reached the far west of India, and was carrying home a cargo of high value, which he feared was not very secure in his place of anchorage. The people on shore and in the ships were regarding him with suspicious looks. He begged his Majesty to allow him to leave the *rastelo* and to go up the river with his ship to the city, in which his cargo would be less exposed to danger.

This letter of Columbus to King Joam is not in existence. He gives only an abstract of it in his journal. But on the same day, the 4th of March, he dispatched another letter to Castile, addressed to King Ferdinand's ration-master, Don Luis de Santangel, which contained a summary report of his discoveries. This was the same letter \* that Columbus had written at sea and had fastened to the bowsprit in a cask, fearing to lose his ship. He now dispatched the original, but not without slipping into its envelope a paper (*anima*) on which stood briefly written that he had encountered heavy weather at sea, but that he was now safe in the harbor of Lisbon. A laconic postscript, indeed, which undoubtedly gave as much thought to King Ferdinand as the important report itself.

On the following days, the 6th and 7th of March, Columbus notes in his journal that almost half Lisbon had come running out to see him, to express their astonishment, their admiration and their congratulations upon his success and wonderful return. Others, however, he writes, gave open vent to their angry feelings that the king had allowed so fair an enterprise to slip from his grasp. The Lucayan captives were particular objects of curiosity and comment.

On the 8th of March, Don Martin de Noronha, a royal chamberlain, made his appearance in the harbor. He was the bearer of an answer in the king's hand-writing, by which Columbus was courteously invited to an audience in Val de Paraiso, and to be his and the nation's

\* The identity is proved by the date, which shows the 15th of February, while the postscript (the *anima*) slipped into the envelope, is dated Lisbon, 4th of March, 1493.



guest. The king, moreover, expressed his congratulations upon the admiral's fortunate arrival in his realm and near his person. He hoped that the admiral would not heave anchor before having seen him. At this point a somewhat sour remark as to the sincerity of the king's feelings slips from Columbus's pen. However,—so he continues,—\* in consideration of the sworn friendship between the two kings he determined to obey the courteous summons, mainly with the hope of dispersing King Joam's suspicions that he came from his African possessions; and on the same day he started for the court. They had one night's rest in Sacavem and on the 9th of March, before noon, they reached Val de Paraiso, where a host of nobles came to meet him and lead him into the presence of the king.

We know the two had often met before. Joam, indeed had always been a gracious monarch to Columbus. He had made the poor and wandering Genoese a subject of his kingdom, had given consent to his marriage with the daughter of one of his vassals, had listened to his projects with an ear more willing and attentive than had any of the learned *junta*, never positively rejected his proposals, but always kindly asked him to wait a little, for the time had not yet come. When later and for reasons above quoted, Columbus had absented himself in Spain, Joam had requested him in the kindest manner to return, promising that all should be forgotten, and that the justices should not interfere with him, for that he would stand under the royal protection.† But Columbus had

\* *Hist. d S. F. C.* pag. 163 : Nel che l'Ammiraglio fù alquanto dubbioso : ma, cōsiderata l'amicitia, che tra lui, et i Re' Catolici era, e la cortesia \* \* \* si contentò di andare á Val di Paradiso. \* \* \*

† This letter is printed in *Navarrete, Tom. II.*, page 5, Num. III., in its origi-



not returned, and now, just five years later we see him standing in the presence of his king as the discoverer of the longed-for Indies, but none the less a shipwrecked mariner asking for aid.

His reception on the part of the king was flattering and obliging.\* Columbus had taken his cap off on

nal Portuguese text. As far as we know, no English version of it has ever appeared. Thus we give it as follows :

"To Christopher Columbus, Our special friend in Seville. Cristóbal Colon. We, Don John, by the grace of God, King of Portugal and the Algarves ; on this side and on that side of the sea in Africa ; Lord of Guinea, send you full salutation. We have seen the letter which you have written to Us : and for the good will and affection which you therein show that you entertain for Our service We thank you heartily.

And as for your coming hither, be assured, that as well for that which you mention as for other matters in which your skill and intelligence will be essential to Us, We desire it, and with great pleasure see it, because in what regards you such order shall be taken that you may be content. And because you may be under some apprehension of Our Courts by reason of some obligations by which you may be bound, We by this Our letter give you assurance for your coming and stay and return that you are not to be arrested, nor detained, nor accused, nor cited, nor sued, civilly or criminally, for anything of whatsoever nature.

And by these presents We charge all Our magistrates to do this Our will. And so We beg you and recommend that your coming be speedy, and that you feel no embarrassment with regard to it : and We hold it for a pleasure to Us, and shall take it as a service.

Done at Avis the twentieth of March, One Thousand Four Hundred and Eighty-Eight.—

THE KING."

No statement can be found in the authors as to whether or not Columbus advised himself of so gracious an invitation. It is far more probable that he did not go. At the time when he wrote to King Joam, he was already deeply engaged with the Kings of Castile, as well as with some Grandees, who had favored his scheme and had supported him with money. An engagement of another nature may have prevented him from leaving Cordova. Doña Beatriz Enriquez de Arana was expecting about this time the birth of Fernando and must have prevailed upon Columbus not to leave her, the fear weighing upon her mind that he might remain in Portugal where he had been living in wedlock with the mother of Don Diego, and that the King Joam would induce him to remain there.

\*No author gives a more detailed description of the three audiences with King Joam at Val de Paraiso, than Columbus himself. See *Navarrete, Tom. I., page 1-175, Journal of First Voyage*, and dates March, 9th, 10th and 11th—Fernando, in

entering the hall, but the king bade him to cover his head and be seated by him. All stood in watchful expectation of the turn this audience would take. Providence itself, such was the undisguised feeling of those present, had shown its hand by bringing a traitor back and placing him before the tribunal of his temporal judge.

The king asked Columbus to narrate the details and adventures of his voyage. He did as bidden, and with this the audience would have been at an end. Only when rising the king could not refrain from making the remark that although he was willing to oblige the king of Castile in all his desires, he nevertheless was of the opinion that this voyage of the admiral toward the west had been made contrary to the stipulations agreed upon between the kings a few years ago, and that the newly-discovered islands, accordingly, were his possession. Somewhat more than straightforward was Columbus's answer. "I have but obeyed orders to sail. I did not touch Guinea nor the fort of la Mina and I have faithfully carried out my instructions." "It is well," retorted the king, "it is not my habit to treat such matters with a third person." These words were the signal of dismissal.

That night Columbus was the guest of Don Diego

---

his *Historie*, ut sup. follows his father's text almost *verbatim*. As to the Portuguese writers they confine themselves to speaking of Columbus's undeserved good luck and the indignation aroused by his overbearing remark made to the king. To quote only *De Barros, Decada primeira da Asia, Tom. I., Livro 3, Cap. XI. fol. 56*; (Lisboa, 1628).—"E porque Colon fallava maiores grandezas, e cousas da terra do que nella hauia, e isto com huma soltura de palavras, accusando, e reprehendendo a El Rey em não acceptar sua offerta: indignou tanto esta maneira de fallar a alguns fidalgos, que ajuntando este avorrecimento de sua soltura, com a mágoa que viam ter a El Rey de perder aquella empreza, offerecêram-se delles que o queriam matar, y com isto se evitaria ir este homem a Castella."—

de Almeida, the prior of Crato and the king's intimate friend, by whom he was entertained with the utmost courtesy. On Sunday, the 10th of March, after mass, Columbus was again summoned to an audience before Joam. The subject of the conversation on the previous day had been merely confined to the voyage and to the personal adventures connected therewith. This day a discussion was opened. Those assembled took part in it, and they made it hard for Columbus. He was asked questions which, for motives of discretion, should have been suppressed, but which on the other hand he was not able to evade. For instance, doubts were very cunningly expressed to him of his having been in the Indies at all. It was pointed out to him that, starting from Castile, no one could reach the Indies in a voyage of but thirty-three days. No minutes of this interesting audience are extant, but from the general reports on record it is natural to conclude that, in order to satisfy themselves, Columbus's examiners requested him to point out to them his sailing course, to give them some account of the winds and currents he had met with, of the degrees of latitude and longitude in his day's reckoning, and of the size and position of the islands discovered. Undoubtedly his impression must have been that he stood before a set of inquisitors who, under the veil of an excited curiosity, were eagerly bent on snatching from him the secret of his wonderful passage, and of the very location of those islands in the far west. But, on the other hand, there was no reason why he should not satisfy these envious inquisitors. He could endure the pressure ; for, was it not in the name of the King of Castile that he had solemnly taken possession

of the islands, and was he not certain that this possession would be maintained and defended? Nor did he fail to exhibit on this occasion the products brought home from the Indian soil. He showed to the assemblage the pepper that he had gathered in Cuba, the cinnamon bark from the Bahamas, the golden ornaments procured from the Caribs and Lucayans, and, as a final proof that he had indeed been in India, the Lucayan captives were led into the hall. Up to this time the king is said to have indulged in spicing his doubts and questions with the salt of humor and slight sarcasm. His mood changed at the first glance cast upon the Indians. His countenance grew pale and serious. He exclaimed: "No, indeed, these are not my people of the Guinea coast. Their color is black, their hair is woolly. These have the light complexion of the people of India, as I have been told. Only look, how straight is their hair!"

It may have been at this moment that, as we are told, the imprudent remark escaped the lips of Columbus: "Indeed, had your Majesty only shown me more confidence and lent an ear to my proposals some years ago, the King of Portugal would now be the ruler of India." These words aroused a storm of indignation in the assemblage that found echo in the whole nation.

When the audience was ended, some cavaliers of the Court approached the king with a proposal to remove the foul slanderer at once, in one way or another, on his return to the harbor. The great secret, they said, ought to be buried with the man himself. The plot met, however, with the most serious disapproval of the king.

There then followed a third and last audience, with which Columbus took his farewell of the king. He could not, however, refuse to accept an invitation on the part of the queen Leonor, who had expressed her wish to meet him in the Convent of San Antonio. There Columbus saw her in company with her brother Emanuel\* and the Marquis Don Jorge, both belonging to the household of the queen. So it seems that not without wise forethought, care was taken that every prominent personage of the kingdom was given a chance to hear from the lips of the remarkable adventurer himself the story of his expedition. Witnesses and testimony were to be gathered, and the perfidious infraction of the treaties laid before the Cortes, in whose hands the decision as to the final measures rested.

The cavalier Don Martin de Noronha was Columbus's inseparable companion on the way back to the harbor. When they arrived at the *rastelo*, they were overtaken by another cavalier to offer Columbus saddle-horses for his return to Castile. Of course Columbus declined the courteous offer and shut his eyes when one hundred ducats, as a present from the king, were slipped into the hand of the first mate of the Niña.

One of the admiral's last acts in Lisbon was to despatch a letter to Don Rafael de Sanchez,† who was

\* Columbus (Journal, March ii.) speaks only of the "*duque y el marqués*." If we consult *H. Schaefer, Gesch. v. Portugall (in Gesch. d. Europ. St., Heeren und Ukert) Vol. II., pag. 655, sqq.* it will become evident that by the first was meant Don Emanuel, the Duque de Braganza e Conde de Beja, the only survivor of the four brothers of Queen Leonor, and by the other, King Joam's illegitimate son, Don Jorge, as he was called by the people, both having been attached by the king to the queen's household.

† This letter is printed in *Navarrete, Tom. I., pag. 178-197*, with a version in Latin, the translator being Leandro Cosco, Roma, 1493. In this Latin shape, as

the ration-master of the Kings of Castile. This letter is dated 13th of March, 1493, but no mention is made in it of the stay in Lisbon, nor of the audiences with the King of Portugal. It is a mere copy of that previously sent to Don Luis de Santangel. Columbus soon after weighed anchor, and we do not hear of him prior to the date of March 31, when, amid the enthusiastic cheers of the whole populace, he made his entrance into Seville. Thence he hastened to Barcelona, where King Ferdinand was holding his Court.

The first great affair of state planned in this city was to obtain the papal confirmation of the possession of the new islands, and a permit for further discoveries to be made in the same direction. How quickly Ferdinand's messengers accomplished their journey is shown by the date of the Bull, Rome, the 4th of May.

Meanwhile, those in Lisbon were not inactive, for immediately after Columbus left the Tagus River, the deeply-mortified king summoned his Cortes to assemble

---

is known, the letter made the round of Europe and conveyed to the learned world for the first time the knowledge of the discoveries in the West. The Spanish text, taken sentence by sentence, is in substance identical with Columbus's letter addressed from Lisbon on the 4th of March, to Luis de Santangel. In wording, however, this Sanchez-letter differs materially from the one to Santangel, in which we have the words as they were put down originally by the discoverer, while the Sanchez-letter must be regarded as a paraphrase. It is couched in such an elegant Castilian as Columbus never was able to write. Containing, as the letter does, news so important and so closely connected with the glory of the king and the nation, it was well thought of in the publisher to present the document in a finished and attractive style. Upon comparing the two texts it will be found that the Sanchez-letter mentions two islands more than those named in the Santangel-letter, *i. e.*, *Matinino* and *Caris*. In this the paraphrase appears to be more correct than the original, in which either the copyist or the printer read "*matrimonio*" instead of *Matinino*, and omitted the "*Island of Caris*," from the place in which Columbus must have mentioned the name when speaking of the habits of the Lucayan Caribs. On the other hand, the reader is surprised to find the *legua* computed at three *millas*, four of these being generally reckoned as equivalent to one *legua*.

in Torres Vedras. Vengeance was to be taken and war to be declared. There must have been many doubts and varying opinions as to how the purpose could be accomplished, and whether Portugal could make head against the powerful monarch beyond the Guadiana. Yet, even then there was a fleet lying at anchor in the Island of Madeira ready to start for an expedition along the African coast. Nothing, therefore, was easier than to acquaint the commander, Don Francisco de Almeida,\* with the suggestions and facts so deftly gathered from the Castilian admiral, to send ships in the track of his course, and, if necessary, to fight out the duel at sea for the possession of India. This was the verdict of the people, for they felt and knew that they were masters on the water. Yet there was still another party. They wished to wage the war on land. They longed to have the throne of Castile occupied by Juana, the legitimate successor to her father, the King Henrique of Castile, since it was by mere trickery that she had been superseded by her cousin Isabel, the consort of Ferdinand. The unfortunate lady had found refuge in Portugal, and it was rumored that King Joam, on the road to Torres Vedras, had stopped at her residence and had had a long interview with her. It was further ru-

\* This is the name of the presumed commander of the expedition, as it is given by the Portuguese historians. It is confirmed by the author of the *Annaes da Marinha Portuguesa*, Sr. Dom Ignacio da Costa Quintella, Lisboa, 1839, where, in the chapter of Reinado del Rei Don Manuel, and on page 222, he says: "Em consequencia deste parecer mandou armar huma Esquadra, de que nomeu Comandante en Chefe a Don Francisco de Almeida, filho do Conde de Abrantes." On comparing *Barros*, Tom. ii., Dec. 2, libro 3, cap. x, fol. 77 and 78, it will be found that the famous conqueror of the Indies and the commander of the West Indian caravels must have been one and the same person: "Foi dō Francisco d'Almeida filho septimo de dō Lopo d'Almeida, primeiro Conde de Abrantes (fol. 77), and "foi dō Diogo d'Almeida, Prior do Crato, seu iram" (fol. 78).



mored that the king's intention was to draw the princess from the obscurity in which she lived, to bring her before the public eye, and set ablaze again the old war of succession.\*

The Cortes assembled in Torres Vedras resolved, however, to follow the great current of national feeling. Upon presentation of the matter the king said that he did not care at all for his relationship to the kings of Castile. It was not a personal affair of his, but that of his vassals, and the whole nation whose honor he had sworn to protect, and who for long years had always considered themselves to be the born rulers of the ocean. By the Bull of 1438 Pope Eugene had settled the boundaries of Castile's dominion in the ocean. In conformity with this no Spanish vessel was allowed to pass the line of the Canaries to the south, and distinct pledges had been given to him on this subject by King Ferdinand before the sailing of Columbus's expedition. Hence, as the Castilian admiral had evidently sailed beyond the boundary line, and as he had found new islands there, these new islands, so he considered, belonged to him and to his people. He was resolved to stand by his right and fight for it.†

The deliberations of the Cortes resulted in a proclamation to the effect that steps had been taken to settle

---

\* On the adventures of this unfortunate princess read *Schaefer, Gesch. v. Port. Vol. II., pag. 580-83*. Special mention of this circumstance is made by a well-informed Portuguese historian, *Damião Antonio de Lemos, Faria y Castro, Hist. geral de Portugal, 20 vols., Lisboa, 1787*. In vol. 8, page 212, he says: "Visita en el camino a D<sup>a</sup> Joanna, presumtiva herdeira de Hespanha. Esta marcha repentina e visita não esperada fizéram nascer o rumor, de que El-Rei determinava inquietar os de Castella, e tirar D. Joanna ao theatro para pretextar o rompimento." \* \* \*

† De Lemos (as above), page 212 \* \* \* glória, que elle entendia reservada só para os seus vasallos, tão conhecidos entam por unicos dominantes dos mares.



the affair in a peremptory way with the King of Castile. On the sixth of April, a royal messenger, in the person of Don Ruy de Saude, was dispatched to make Ferdinand acquainted with the temper and feeling of his aggrieved neighbor. This mission of Saude, to quote the words of our authority,\* was meant only to withdraw attention from Joam's bellicose proclamation and the expedition he had sent out in the track of Columbus's western discoveries. We learn from the same source† that in the letter written by Joam he expressed to Ferdinand the joy he felt at the news of Columbus's success, and his satisfaction that the admiral had kept the line of the Canaries and had not gone to the South: "Now, as his royal brother undoubtedly has the intention to follow up his new discoveries, he had resolved to beseech him, most urgently, to order the Castilian admiral to keep the line of the Canaries. For if he (Joam) on his part, should also resolve to send ships of discovery, he would give orders to his captains, under the most severe penalty, not to cross the line to the north. It was only under such conditions that the right and the property of both would be preserved."

It can hardly be imagined that King Joam could have asserted his rights with more firmness and at the same time have declared his understood intentions more art-

---

\* See Geronimo Çurita, *Anales de Aragon, Hist. d. Rey Don Hernando el Católico, Çaragoça, 1670, Tom. 5, pag. 30 sqq.*—"porque con este color dissimuló lo de la empresa, que se publicó que queria seguir en el mismo descubrimiento de Colon."

† Çurita, *as above*.—One cannot read Çurita on this subject without gaining the conviction that he had access to the whole of the official correspondence exchanged between the two kings, and now no longer within reach. Although he is not so positive and explicit about the dispatch of Portuguese ships on the track of Columbus as we shall see that King Ferdinand was, he takes the whole affair for granted, and so do de Barros and the rest of the Portuguese chroniclers.

fully than in the words quoted. His heart must have burned with anger to see his ocean-kingdom invaded by his powerful neighbor. He expresses himself however as if Fernando were rather welcome to continue the discoveries. He does not directly threaten to seize Ferdinand's ships should they be found south of the dividing line. He puts it indirectly, that he would pitilessly punish his own captains should they be found north of the line in Ferdinand's waters. Joam was thoroughly convinced of the trespass of Columbus, but he does not in any way refer to it, when speaking of him. On the contrary he only praises his accuracy and congratulates Ferdinand upon having so capable a subject.

Notwithstanding the speed with which Saude travelled, rumors preceded him to Castile of naval preparations made in Portugal with the object of seizing the islands. King Ferdinand, alarmed by these rumors, hastened to send to Lisbon, even before Saude's appearance at the Court, one of his most trusted councillors, Don Lope de Herrera. Herrera was the bearer of two royal missives. One of these was to be handed to Joam, if the envoy on his arrival was convinced that no warlike preparations were going on in Portugal and that no ships had been sent out to the West. The same missive also contained Ferdinand's thanks for the good reception which Joam had given to Columbus, and an entreaty to avoid the difficulties certain to arise if ships had been sent to take possession of his new territories. Since he and his predecessors had always taken the greatest care to respect Portugal's discoveries along the coast of Africa, he might fairly expect the same consideration from Joam in the present instance. The other missive Herrera

was bound to present should he observe that Portugal was bent on war. This second letter contained a curt summons to stop preparations; failing which, it would be left to war to decide between the two kingdoms.\*

It seems that Herrera on reaching Lisbon did not get the impression that Portugal was busy with preparations for war. As for the fleet, which was stationed, not at Lisbon but at Madeira, little could be learned, for the admiralty kept its own counsel with regard to its plans and the destination of the ships.†

Rumors as to the dispatch of vessels had been afloat before and must have reached Herrera when at Lisbon, but he was not able to get at the facts, which gave rise to the rumors. It is therefore probable that he resolved to present the first of the missives, and of this story corroboration will be found in a letter written by King Ferdinand to Columbus, who then resided in Cordova.‡ This letter expresses confidence in the preservation of

---

\* *Curita*, as above: \* \* \* "que si el Rey de Portugal hubiese embiado o quisiese embiar à las islas, no se le diese *esta carta*—sino solo *una de creencia*, para requirirle con mas aspereza—y que lo mandase pregonar en su reino."

† It had been for years the policy of the Crown of Portugal to spread a thick veil over all its Oceanic expeditions. In order to keep these out of sight of foreign spies, the Royal Naval Station had been removed to the port of the Island of Madeira. The assembling of the fleet and its waiting for orders to sail, just at this time, is attested unanimously by all contemporary writers. Compare on this subject *Dr. Heinrich Schaefer's* master work, *Geschichte von Portugal*, in *Geschichte der Europ. Staaten von Heeren und Ukert*, Hamburg, 1836-1854, 5 volumes, and especially Vol. iii., page 67, *sqq.*

‡ *Col. de Documentos inéditos, Madrid, 1878, Tom. 30, pag. 171.* El Rey e la Reyna á Don Cristóbal Colon, Barcelona, Xunio 12, 1493. \* \* \* Agora vino á nos Herrera, nuestro mensaxero, el que abiamos ymbiado al Rey de *Portugal* sobre las carabelas que nos descian que ymbiaba a las dichas yslas e Tierras Nuestras descubiertas e por descubrir \* \* \* e para que se declare esto, disce que imbiara a nos, sus mensaxeros, los cuales aun no son venidos, e fasta que vengan, disce que no ha ymbiado nin ymbiará navios algynos.

peace. It says: "Herrera has just arrived here. You know we sent him to the King of Portugal on account of those caravels, rumors of the dispatch of which to the islands of your discovery had come to our ears. The answer we have received is well-worded and gives us satisfaction. It seems that the king's intentions are in full conformity with ours, which are that each of us shall keep that which belongs to him. And in order to come to an understanding, he says that he will send to us ambassadors, who have not yet arrived, and he also says that before their arrival he has not sent, nor will he send, ships to the West. You shall learn of all this in time. As to your departure, make haste and observe economy; notify us also of all you hear from Portugal." . . .

Columbus's sailing had been fixed for the 15th of August. The preparations had been made on the grandest scale. Not only were the new islands to be peopled with colonists, and the latter to be furnished with provisions until a crop had made them self-supporting, but care was also taken to protect them as well as the vessels against any attack at the hands of the Portuguese.

The whole month of July passed and neither King Joam's messengers nor the Pope's promised Bull had arrived in Castile. It was not till the first week of August that the papal confirmation came to the hands of King Ferdinand.\* We translate the words with which he sends a copy of this Bull to Columbus. "Barcelona, August 4, 1493. The Bull concerning the islands and countries which you discovered and are to

---

\* *Doc. Indditos*, Tom. 30, pag. 194.

explore still further, has just arrived here. We send you an authorized copy and translation of it to be promulgated there so that everybody may become acquainted with it as well as with my will, that no one without my special permission is allowed to go thither. Take this copy with you on board. For, should you be compelled to enter any port of any country, you may show it to attest your authority. We are still in expectation of King Joam's messengers. . . . Do not forget to send us the promised sailing chart."

Columbus's ships were not ready to sail by the 15th of August. It was not before the 27th of September that he was able to weigh anchor. In these six weeks of delay various events occurred which, in our judgment, cast a flood of light upon the problem of our chart, and we call attention to some interesting points of the correspondence between Ferdinand and Columbus. The king writes from Barcelona, 18th of August, 1493:\* "As to what was written to you about the King of Portugal concerning his dispatching a caravel from the island of Madeira, and as to your offer to give chase, you have my full consent to do so; but you will take care not to allow the ships you intend to select for such a purpose to touch at Guinea or the port of La Mina, for they are in the domain of Portugal. . . The embassy has now arrived here, but has not yet been presented to me. I trust that they will approach us in the spirit of justice and reason, for this is all we ask and wish. Should the King of Portugal, however, have prepared a fleet to sail on your course, do not be troubled. All this will be settled, and well settled, with

---

\* *Doc. Inéditos, Tom. 30, pag. 202.*

the help of God. Therefore, do not tarry, but leave as soon as possible. Do not keep too near the coast of Portugal, else they will see you and sail after you."

This letter is followed by another: "Barcelona, 5th of September, 1493.\* "You will remember our letter, in which we told you that the King of Portugal sent messengers to us to confer on the subject reported to him through Lope de Herrera, which was that we would not allow anybody to sail to those parts which are ours. We had a long conference with those gentlemen on this affair, and it almost seems as if no agreement can be reached. They now know plainly what we want, and tell us that they wish to be furnished with new instructions from their sovereign. . . Make haste and sail as soon as possible. . . Avoid the Cape of St Vincent and the whole coast of Portugal. They must not learn your course. . . And now, as to what you wrote us some months ago about the news you had from Portugal, that a caravel had left Madeira to go to the islands and to parts whither the Portuguese never had gone before, *the messengers pretend that he who sailed in that caravel did so without the orders of the King of Portugal, and that the king sent three caravels after him to seize him. Now,*

---

\* *Doc. Inéditos. Tom. 30, pag. 211, 212 and 213 . . .* "los quales (mensajeros) vinieron aqui, e con ellos se ha mucho platicado en el negocio, e creemos que no se podrá concertar, porque ellos vienen informados de lo que Nuestro, e creemos que quieren consultar con el Rey de Portugal. \* \* \* E porque ya sabeis que nos escribisteis que abiades sabido que de la isla de Madera era partida una carabela a descubrir ysla o tierra a otras partes que non an ydo los Portugueses fasta aqui, y estos mensajeros del Rey Nos dicen que aquel que fué en la carabela lo fizo sin mandamiento del Rey de Portugal, e *quel Rey abia ymbiado en pos dell otras tres carabelas para lo tomar, e podria ser questo se ficiese con otro respecto, o que los mis mos que fueron en las carabelas, unas o otras querrian descubrir algo en lo que pertenese d Nos, por ende nos mandamos.* \* \* \*

*what other object can this have had than that the three should join the first, and all the four together sail in search of those parts and islands which belong to us?* Therefore, we order you to attend to this affair, and with much zeal, and to provide that neither these nor any other caravels that may be further sent out with like intentions, shall be found making discoveries within the reach of our boundaries, and which are best known to you. For, although we do not despair of there still being a chance to come to an agreement with the King of Portugal, it is but reasonable, and we shall insist on it, that those who have dared to enter our possessions shall be severely punished, and ships and crews be seized. Moreover, the same messengers express to us the belief that there might be islands and mainland lying between the Cape of Africa and that line which you wanted to have drawn in the Bull of the Pope. Now, as in our opinion you must know more about this than any other man, we wish you to provide us with information on this point; for, should you be really of the same opinion as they, we might possibly find it convenient to ask for an alteration of the Bull in this regard. . . Do not forget to send us your sailing chart, and the map you promised to make, as well as the number and the names of the islands which you discovered."

It is to be regretted that Columbus's side of this correspondence with King Ferdinand is not preserved or at least has not yet come to light. At the same time that of the king alone appears to us sufficient. For his communications to Columbus furnish the *formal confession* on the part of the Portuguese ambassadors that four caravels had sailed from Madeira to the west in the track of Col-



umbus's discoveries. The whole manœuvre had been managed with great adroitness and secrecy, yet it did not escape the vigilance of Columbus's friends and the spies of Ferdinand. The king must also have been possessed of positive evidence as to the dispatch of the caravels and must have laid it under the eyes of the ambassadors. Hardly otherwise would they have confessed the fact; and we must admire the sagacity with which the monarch penetrated the specious disguise of the envoys.

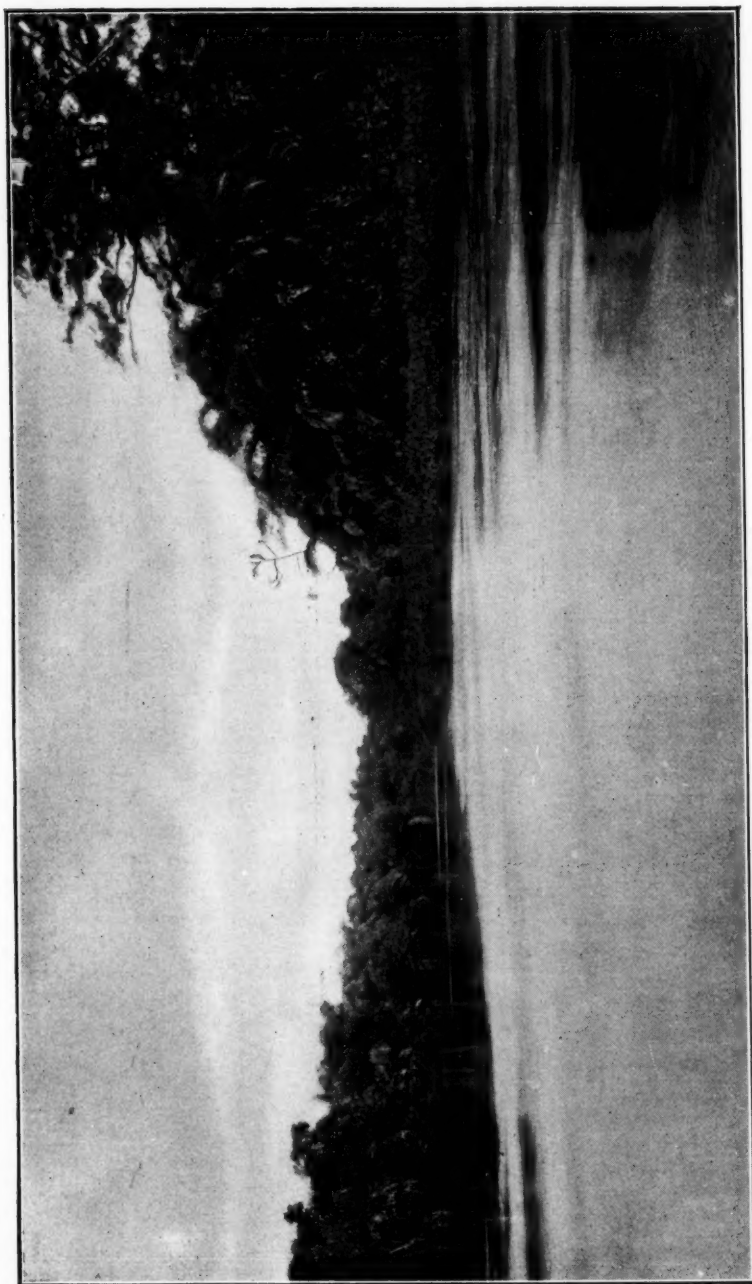
Regarding the despatch of the caravels as a matter beyond doubt our chart affords evidence of a very strong character that they arrived also at a *point farther west than that reached by Columbus*, and returned, bringing with them a report and the picture of what they had found.











SAN JUANILLO RIVER

## THE RIO SAN JUAN DE NICARAGUA.\*

BY

CIVIL ENGINEER R. E. PEARY, U. S. N.

Two thousand miles from New York Harbor, and eight hundred miles southwest from a steamer rounding the eastern end of Cuba, there empties into the Caribbean Sea a river which, from its physical characteristics, its history and associations, and its inevitable future, is unique among the rivers of this hemisphere; the Rio San Juan de Nicaragua.

That Nicarao, Diriangen, and the other caciques whom Avila in 1522 found reigning west of Lake Cocibolca (Nicaragua) were aware of the existence of this river seems probable; but that there were ever villages along its banks or that these chiefs knew more about it than the vaguest rumors, is very doubtful.

Even after its discovery, the absence of history's mordants, gold and blood, has left the story of the river for years scarcely less vague and uncertain than before.

When Columbus in his fourth and last voyage doubled Cape Gracias á Dios, on the 14th of September, 1503, he sailed directly south along the coast, about sixty-two

---

\* Not having had time or opportunities for access to original documents, the historical notes in the following paper are drawn principally from Lévy's "Nicaragua," Squier's "Nicaragua," and Irving's "Voyages of Columbus."

The remainder of the paper and the charts are based upon the work of the various Government Expeditions from 1871-1884, and the writer's personal experience in the Expeditions of 1884-85 and 1887-88.

R. E. P.

leagues, and on September 16th anchored near a copious river. A boat sent in for wood and water was swamped on the bar when returning to the ship and lost with all on board. In memory of this event Columbus named the river Rio del Desastre.

Leaving this river he continued for several days along the coast, until on the 25th of September, with his ships nearly disabled by storms, he anchored between a small island and the mainland in a delightful and commodious situation. "Immediately opposite, at a short league's distance was an Indian village, Cariari, on the bank of a beautiful river. The country around was finely diversified by noble hills and forests, with trees of such height that Las Casas says they appeared to reach the skies."\*

October 5th the fleet left Cariari, and after sailing twenty-two leagues to the eastward entered Almirante Bay at the western extremity of Chiriquí Lagoon. Both Cape Gracias á Dios and Almirante Bay retain their names to the present day and are well-known places.

The intermediate localities above mentioned are doubtful.

Twenty-two leagues northwesterly from Almirante Bay falls very near to Port Limon, Costa Rica, and sixty-two leagues south of Cape Gracias á Dios brings us about half way between the mouth of Bluefield River and Monkey Point. Between the points thus located is a stretch of coast one hundred and ten miles in length. Some writers have supposed the Rio del Desastre and the San Juan to be the same. Lévy however considers the Rio Grande de Matagalpa to be the Rio del Desastre, and places Cariari at the mouth of the Rio Rama.

---

\* Irving's Voyages of Columbus.

This last theory makes two circumstances difficult of explanation.

1. How so acute an observer and skilful a navigator as Columbus, could have failed during the nine days of storm, which on the above assumption he must have passed off the coast between the Rio Grande and the Rio Rama, to discover and run into some one of the numerous sheltered lagoons which extend along this entire portion of the coast.

2. How the same skilful navigator could have made so gross a mistake as to estimate one hundred and sixty miles at twenty-two leagues.

It is much easier to imagine that before a favorable wind and aided by the doubtless undetected southerly current which runs along that coast, he would underestimate his progress after leaving Cape Gracias á Dios, forty miles in a total distance of two hundred and fifty, particularly if, as was doubtless the case, his was dead reckoning.

This last hypothesis would make the Rio del Desastre and the San Juan the same, and would locate the nine days of tempest off the coast between the mouth of the San Juan and Port Limon, which seems more probable.

The copious flood mentioned would, on the whole, rather point to the San Juan, while the absence of any mention of a harbor at the mouth of the river would not militate against the theory, as it is by no means certain that the harbor of San Juan del Norte, or Greytown, is not a formation since the time of Columbus.

On this hypothesis Columbus was the first European to look upon the waters of the grand Rio.

If, on the contrary, we assume Columbus's estimates of distance as correct, then we are forced to the conclusion that the honor belongs to another.

Gil Gonzales de Avila, the discoverer of Nicaragua, supposed that the Lagoon Cocibolca (Lake Nicaragua) discharged into the North Sea. He, however, was prevented from deciding the question by a war then in progress between some of the native chiefs.

About 1528 Martin Estete partially explored the outlet of Lake Nicaragua, and named it the Rio San Juan. Estete, however, was unable to pass the rapids, as the river was very low.

In 1529 Diego Machuca, a resident of Granada, built boats upon Lake Nicaragua, and after circumnavigating the lake, descended its outlet to San Juan. He passed the rapids which had stopped Estete the previous year, reached the Atlantic with the same vessel in which he had weighed anchor at Granada, and then sailed along the coast to Nombre de Dios.

Oviedo, writing in 1540 of this exploration, states that Machuca advanced by land at the head of two hundred men, taking the same course as the boats. Machuca gave his name to the rapids in the river, and gave the name of San Juan de las Perlas to the port which he found at the mouth of the river.

In 1551 the historian Gómara indicated the Rio San Juan and the Lake of Nicaragua as one of the most practicable routes for water communication between the North and South Seas.

In 1570 the commerce of Central America was carried on by the South Sea, the pirates permitting no navigation of the North Sea except from the ports of



Vera Cruz or Cartagena, from whence ships sailed conveyed by vessels of war. But in 1579 the pirates penetrated into the South Sea also, through the Straits of Magellan, and in 1583 Realejo was fortified in expectation of an attack.

Commerce then found an outlet by way of the Nicaragua Lake and the Rio San Juan and waiting in the lower river until the coast was clear, the vessels sallied forth and kept along the shore to Nombre de Dios or Cartagena. Granada thus acquired a great supremacy in the internal commerce of Central America. The resulting prosperity, which drew upon the city many misfortunes, reached its climax in 1592. Vessels of eighty to one hundred and twenty tons, and some even larger, plied between Granada and Nombre de Dios, Havana, and Cadiz. This rich traffic could not fail to attract the attention of the rapacious and ever-alert pirates. For a long time they threatened to ascend the river to the lake, and finally, in 1665, a party under Davis succeeded in doing so, and captured San Carlos and Granada. Immediately after their retreat a redoubt was erected at Santa Cruz, now Castillo, and another at Toro, and, in addition, these two already difficult passages were ordered to be still further obstructed with rocks. Other defensive works were erected along the river, but in 1670 the pirate Gallardillo penetrated to the lake in spite of all resistance, dispersed the inhabitants of the settlement behind the fort at San Carlos, and devastated several settlements along the shore.

Then was ordered the construction of a castle at the rapids at Santa Cruz, which upon the completion of the work was called the Rapids of Castillo. At the

same time some dozen fortified stations were established along the river ; and the channel of the Colorado at the place where it leaves the main river was widened in order to diminish the quantity of water which passed through the San Juan.

The river was now so well fortified that the pirates could no longer ascend it, but that did not prevent them from watching its mouths. The current of commerce was interrupted, and the prosperity of Granada began to decline. The capture of the city by L'Olonnais, in 1685, gave it its death blow.

In 1769, the English entered the river, but were unable to ascend beyond Castillo. In the attack upon the fort the Commandant Herrera was killed, but his daughter, a señorita of eighteen years, took command and repulsed the attacking force.

In 1780, another English expedition of two hundred men, under Polson and Nelson, moved up the river and captured Ft. Castillo.

In 1796, the port of San Juan, at the mouth of the river, was made a port of entry by royal order of the King of Spain.

Thirteen years later, in 1809, there appeared in Madrid, in the *Portulano de la Setentrional*, the first published map of the port, of which we have any knowledge.

In 1832, a French survey of the harbor was made.

In 1848, a third English expedition ascended the San Juan to the mouth of the Sarapiquí and dislodged a Nicaraguan force there.

In 1850-51, the first scientific survey of the river was made by Childs.

In 1851, an American company began running steamers from the mouth of the river up to and across the Lake, and in the next few years carried thousands of passengers and large quantities of treasure across the Isthmus. The construction of the Panama R. R. drew all the passenger traffic away, but with some interruptions and various changes of owners, steamers have been running from the harbor of San Juan to ports on the Lake up to the present time. There is now plying upon Lake Nicaragua a twin-screw steamer capable of carrying one hundred and fifty tons, which steamed from Wilmington, Del., where she was built, up the San Juan to the Lake.

Since Childs's survey the river has been repeatedly surveyed in connection with the interoceanic problem, until now there is hardly a river in the United States of which we have more accurate knowledge.

To those fond of analogies the San Juan and its lakes present a very striking counterpart in miniature of the St. Lawrence and its lakes.

The physical peculiarities of this river and its basin, have naturally led to various theories as to their causes. The most interesting one is that the Lakes Nicaragua and Managua and the San Juan occupy the lowest portions of the elevated bed of what was once a broad strait stretching N. W. and S. E. between the two oceans. This is given by Lévy, but whether it originated with him or not I am unable to say.

Whether this theory be true or not only a thorough study of the comparatively unknown geology of the country can determine; but plausible it certainly is as one cannot fail to admit who stands upon the roof of the Cathe-

dral of Leon and sees the great plain of Leon spreading like a floor from Lake Managua to the Pacific, then traverses the two Lakes and the Rio San Juan to the mouth of the San Carlos, and from an elevation of a thousand feet at this point looks E. and S. E. to the Caribbean across forty miles of forest, level as a floor, covering a V-shaped section of low swampy country once evidently an arm of the sea, now besprinkled with lagoons and intersected by tortuous, sluggish streams. Previous to this elevation of the land the waves of the Caribbean doubtless beat against the bases of the San Carlos mountains, and the spurs that come to the north bank of the San Juan from the Rio San Carlos to the San Juanillo.

The *embouchure* of the San Juan is at the northwestern extremity of a stretch of coast one hundred and fifty miles long, which forms the bottom of the Gulf of Veragua, and lies in an almost straight line perpendicular to the constant rush of the northeast trades across the Caribbean Sea.

Northerly the coast trends east of north two hundred and forty miles to Cape Gracias á Dios, and throughout the entire distance from Cape Gracias á Dios to Chiriquí Lagoon, there is a strip of varying width of flat, swampy, lagoon dotted country, formed of the detritus pushed out from the ragged edges of the gaunt volcanic skeleton of the Isthmus by the numerous rivers.

Though this coast has grown out into a practically tideless sea, it is interesting to note how the constant rush of the trade winds and the accompanying uninterrupted hammering of the waves, in a single direction, have moulded the coast line and given it features very similar to those of our own coast south from New York.

In one place the sands are shifted along the shore and all the river mouths are deflected in the same direction ; in another the sand is beaten directly back upon the coast to form a narrow, cordon littoral.

On approaching the coast the shore appears low and unrelieved for miles into the interior, where blue hills can be seen rising above the trees. On the right, the high blue mountains of the Mosquito Coast are visible, and directly ahead, if the day be clear, tower the mighty turquoise masses of the Costa Rican volcanoes.

Crossing the bar and traversing the harbor lagoon to Greytown, a flat-bottomed, stern-wheel steamer offers the means of navigating the river. For three or four miles from the harbor, as far as the mouth of the San Juanillo, which enters from the right, the course of the river is comparatively direct, there is always a good depth of water, and the stream is bordered on both sides by a broad strip of luxuriant zacate grass, the home of alligators, *garzas* or white herons, and numerous small birds. •

The San Juanillo, which drains a large section of low lagoon country, is at its confluence with the San Juan a larger stream than the latter, and could easily be mistaken for the main stream. The view up the San Juanillo at this point is characteristic and beautiful in the extreme. On one side of the long, curving stretch of the stream at this point is a ribbon of zacate grass, even and regular, waving like a field of grain, on the other a continuous wall of the graceful, glistening fronds of the silico palms tossing and rustling in the wind.

Five miles above the San Juanillo the Tauro mouth leaves the San Juan and flows N. E. to the coast, three

miles below the harbor. From here to the junction with the Colorado the Lower San Juan is cut by numerous islands into a labyrinth of channels. The banks are firm, but there is no sign of hill on either side until the last bend previous to passing from the Lower San Juan into the main river.

Emerging from the San Juan, a broad, straight expanse of river lies ahead with banks wooded to the water's edge, and over the trees, where the river bends to the southward again, looms up the mass of El Gigante, an isolated mountain ganglion, in whose steep ravines the San Juanillo has its source.

From this point to the mouth of the Sarapiquí, a distance of thirteen miles, the river has an average width of fourteen hundred (1400) feet widening to two thousand (2000) feet at several places where groups of low islands divide the stream into several channels.

Five miles above the junction of the San Juan and Colorado is the upper mouth or inlet of the San Juanillo, a narrow, almost grass-hidden canal on the north bank. This San Juanillo will receive further attention later on.

Just below the mouth of the Sarapiquí we have another fine view of El Gigante. Above the mouth of the Sarapiquí the stream is very much contracted by the rocky hill which comes to the river from the north at this point and the current is swift and powerful.

It is an interesting fact that throughout this portion of the San Juan, as well as along the Lower San Juan, there is no lateral drainage into the river. There are many sandbanks along this portion of the river, and during the dry season the steamer channel becomes very tortuous.

At the mouth of the Sarapiquí the river changes its hitherto S. W. general direction and stretches away almost due N. W. for a distance of eight miles to the mouth of the San Francisco, on the north bank; thence it bends south, southwest, west, northwest, north, etc., in several long loops, the resultant direction being nearly due west to the mouth of the San Carlos, twenty-three miles by the river from the mouth of the Sarapiquí; and the average width throughout this section is rather less than in the previous one, being about eleven hundred (1100) feet, and the islands occur singly rather than in groups. Heavily wooded hills come to the river on the north bank at several places, and from the upper deck of the steamer glimpses of others are obtained over the tops of the trees which line the river bank.

The south bank of the river is continuously low to within a few miles of the San Carlos; throughout this section there are, in the dry season, numerous banks, and the depth of water is about the same as in the section below the Sarapiquí. There are also numerous tributaries or *caños* on both sides, those on the south, the Copalchi, Trinidad, and Cureña, sluggish, excessively tortuous streams draining interior lagoons; those on the north the *caños* Guasimos, Tamborcito, Tamborgrande, San Francisco, Danta and Machado; streams, which having their sources in the hills to the north, flow, with the exception of the Machado, through triangular pockets of level swampy ground before discharging into the San Juan. These pockets are usually several miles in depth and their surface is from twelve to twenty feet above the average low-water stage of the river.



Steaming up the straight reach of the river, below the mouth of the San Carlos, the first grand scenery on the river is encountered. Here directly ahead towers the symmetrical mass of the San Carlos mountain with its three flanking conical peaks. This mountain, not less than fifteen hundred (1500) feet in height, guards the lower entrance of the mountain section of the San Juan, and as the steamer makes for it until it seems scarcely a stone's-throw distant, and there is no perceptible break in the dense line of forest which extends on both sides and apparently directly across the river, we wonder if the river bursts full-grown from the earth. Suddenly the steamer swerves to the left till it heads S. E. up the San Carlos, then as suddenly to the right, and, passing close under the shadow of the mountain, enters the narrow, deep, almost currentless cañon of the Agua Muerta. The river for the next thirty-six miles with its numerous turns, its steep mountain slopes rising sharply from the river's edge, its constantly changing succession of mountain scenery is, as Squier says, a tropical Highlands of the Hudson.

Sixteen miles from the mouth of the San Carlos are Machuca Rapids; these rapids, which, at times of high river, are nearly obliterated by the volume of water from above and the backing up of that from below, become during the low-water stage of the river, by reason of the force of the current and the tortuous character of the channel, perhaps the most serious obstruction in the river. Four and five miles above Machuca are Balas and Mico Rapids, and six miles above the latter, Castillo Rapids, at the upper entrance of the mountain defile of the "Desaguadero."

The tributaries throughout this section though numerous are comparatively small and torrential in character ; from the steepness of their descent, however, they would furnish a large and valuable water-power which could be utilized throughout a large portion of the year. On the north bank they are the Santa Cruz del Norte, the Machuca, Mono, Chiquito, Bartola and Castillo, on the south the Siroma and Costa Rica.

The difference between the characteristics of this section and those of the previous one is very marked. The river is much narrower, the average width being six hundred and fifty (650) feet ; there are no islands except small ones at the rapids ; the current, except at the rapids, is slight and at times imperceptible, and the depth in many places is forty to sixty and even seventy-five feet. Above Castillo the character of the river changes again, the tall trees matted with vines so common in the mountain section disappear, the forest growth, though still dense, is less even and coherent, the hills withdraw to such a distance from the river as to be entirely invisible, and the banks are fringed with zacate grass and the feathery silico palms such as grace the banks of the San Juanillo.

Nine miles above Castillo are the so-called Toro Rapids which seem to be merely a bank of loose stones many of which are petrifications, the same in character as those found several miles up Závalo River, the first tributary above Toro on the north bank of the San Juan River. These stones are also said to be of the same nature as those found in Lake Nicaragua and to have been swept here by the current of the river. The average width of the river from Toro to the Lake, a

distance of 26.9 miles, is eight hundred and twenty (820) feet. The average depth is fourteen (14) feet at low river. The tributaries of the river in this section are the Závalo, Palo de Arco, Melchora on the north bank; the Chico, the Raudal and the Medio Queso on the south bank.

At the head of the river on its northern bank is the village of Ft. San Carlos, climbing from Lake Nicaragua on one side and the river on the other up a low hill and back to the ruins of the old fort.

From the bastions of the old fort the eye wanders westward over a wonderful tropical lake, a grand reservoir about twice the size of Long Island Sound.

Out of the bosom of this lake rises Ometepe, a typical volcanic cone, perfect in its tapering symmetry, and across the blue expanse blow constantly the beneficent Trades. West of the Lake the watershed of the river extends to within eight miles of the Pacific.

Southwest the mighty mountain masses of Miravalles, Orosi, Rincon de la Vieja, Poas, Irazú and Turrialba in Costa Rica, which peered down upon us for an instant here and there as we ascended the river, rise in uninterrupted grandeur.

Southeast, east and north the interminable forest reaches up close to the river and the village.

Ft. San Carlos is almost equally distant from the Atlantic and the Pacific, being in an air line fifty-four miles due west from the coast of the Caribbean above the mouth of the Rio Indio, and fifty-two miles due east of the head of Salinas Bay.

The level of the Lake here at low stage is one hundred and three feet above mean sea level; at its high-

est stage it reaches one hundred and ten feet ; its average annual fluctuation is, however, only about five feet. Thus, the river one hundred and twenty miles long, as we have seen, has an average fall from the Lake to the sea of from eleven to ten inches per mile. This fall, however, is quite irregularly distributed, as follows :

From the Lake to Toro, - - - - -	1.65	inches fall per mile.
Over Toro, - - - - -	37.30	" " " "
From foot of Toro to head of Castillo, - - - - -	2.93	" " " "
Over Castillo, - - - - -	83.38	" " " "
From foot of Castillo to head of Machuca, - - - - -	19.08	" " " "
Over Machuca, - - - - -	63.61	" " " "
From foot of Machuca to mouth of San Carlos, - - - - -	.90	" " " "
" Mouth of San Carlos to the Sea, - - - - -	11.50	" " " "

The volume of discharge of the upper river at the end of the dry season (the mean of six gaugings from above Toro to above the mouth of the San Carlos, May, 1873) is twelve thousand two hundred and eighty-six (12,286) cu. ft. per second.

The volume of discharge of the lower river, May, 1873, was above the Sarapiquí fourteen thousand five hundred and seventy-two (14,572) cu. ft; of the Sarapiquí itself, two thousand two hundred and fifty-five (2255) cu. ft. per second ; below the Sarapiquí, sixteen thousand seven hundred and seventy (16,770) cu. ft. per second. The Lower San Juan, after leaving the Colorado, six hundred and seven (607) cu. ft. per second ; the Colorado, after leaving the San Juan, sixteen thousand one hundred and ninety (16,190) cu. ft. per second. The gaugings of Childs in 1851, of West in 1865, and of Howard in 1866, give the volume of discharge of the San Juan above the bifurcation of the Colorado, twenty-two thousand five hundred and twenty-eight (22,528) cu. ft. per second, of which twenty thou-

sand seven hundred and forty-three (20,743) cu. ft. passed into the Colorado, and one thousand seven hundred and eighty-five (1,785) into the Lower San Juan. In the wet season Childs found fifty-four thousand three hundred and eighty (54,380) cu. ft. per second, forty-two thousand and fifty-six (42,056) cu. ft. going to the Colorado, and twelve thousand three hundred and twenty-four (12,324) cu. ft. to the Lower San Juan.

Looking back now over the river, it is seen that it is easily divided into two principal divisions: first, the Upper river, from the Lake to the mouth of the San Carlos, comparatively narrow, deep, free from islands, with no obstructions, and with but little current except at the Rapids. Second, the Lower River, from the mouth of the San Carlos to the sea, broad, shallow, filled with numerous islands, and during the dry season obstructed by frequent sandbanks.

Nothing shows the difference in regimen between the Upper and Lower river more conclusively than the comparison of the high and low water stages of each, viz.: Upper river low water, eleven thousand three hundred and ninety (11,390) cu. ft. per second; high water, eighteen thousand and fifty-nine (18,059) cu. ft. per second, an increase of 59 per cent.; Lower river, sixteen thousand seven hundred and seventy (16,770) cu. ft. above bifurcation in dry season, and fifty-four thousand three hundred and eighty (54,380) cu. ft. in wet season, an increase of 224 per cent.

Throughout the year the fluctuations of the Upper river are very gradual, and during the dry season the water level is nearly constant.

In the Lower river the reverse holds good, the result

of the contributions of the San Carlos and Sarapiquí. Even in the height of the dry season, and without any rain having fallen in the valley of the San Juan, rains in the Costa Rican mountains will send enough water down the San Carlos to raise the San Juan two or three feet.

These San Carlos freshets may always be distinguished by the amount of driftwood brought down.

As already noticed, the maximum range of the river at the Lake is seven feet. Below the San Carlos it is about fifteen feet, and below the Sarapiquí twenty-five feet.

These extreme ranges, however, do not occur suddenly, nor even in the same year. The sudden fluctuations of the river, *i. e.*, those occurring in one day, may be said in no case to exceed five feet.

The delta section of the river is particularly interesting to the student of the regimen of rivers.

The Rio San Juanillo has been shown in all previous charts and described in all previous reports as a cut-off or secondary branch of the San Juan. Recent surveys have shown that the San Juanillo is really an independent stream having its source in the ravines of El Gigante opposite the mouth of the Sarapiquí. Under the name Rio Negro it flows nearly parallel with the San Juan for several miles, and then receiving an accession of volume through a narrow canal from the San Juan, it bends away to the north. The San Juanillo may always have been an independent stream, but peculiar features of drainage and topography in that vicinity have suggested the idea that the above-mentioned narrow canal between the San Juan and the Rio Negro is the remains of the original channel of the San Juan

which once flowed about where the San Juanillo does at present, the Rio Negro being then a tributary of the San Juan.

At that period, doubtless, the sea occupied what is now Laguna Benard, and Silico Lagoon was a bight in the coast under the lee of hills, similar to the present Gorda Bay, and the bight under the lee of Monkey Point.

Later, as the river pushed out a delta, the long and tortuous channel with its flattened slope was unable to carry off the flood volume and this finally burst through the low alluvial apron, along the present bed of the Lower San Juan cutting for itself a more direct channel to the sea. It can easily be imagined then that the large quantity of sediment scoured from the new channel and borne seaward, in addition to the normal sediment load of the river, soon closed Silico and modified the trend of the shore in that locality in such a manner as to compel the discharge of the river in seeking the trough of the sea, to deflect to the northward.

Then began the formation of those lagoons immediately back of Greytown, which were once, without doubt, bights in the shore as was the harbor of Greytown a few years ago, and which were later closed as the harbor of Greytown has recently been.

The sediment brought down by the river, borne away by the waves or deposited upon a deep bottom may for years have no effect. Sooner or later, however, a combination of circumstances, as a heavy flood and a long and severe norther occurring at the same time, dams the river back until an overflow takes place along the line of least resistance to the eastward. This re-



lieves the pressure and at the same time carries a considerable amount of sediment to sea to windward of the main river mouth. This sediment is swept along the shore by the waves until it comes to rest in the quiescent angle between the waves and the main river discharge. Every rainy season then sees an increase in section of the new and shorter channel, and a correspondingly increased amount of sediment discharged from it, and every succeeding dry season sees an accession to the sand spit in the quiescent angle. Finally, this spit extends to and unites with the shore westward; the entire discharge of the river seeks the overflow channel, which becomes the main river; the transference of the river mouth is effected, and the lagoon is born. Years later a second and then a third are formed.

The natural inference of the above is that another bight may in time be formed outside the present harbor of Greytown, and such doubtless would be the case were the formative conditions still the same.

Several circumstances lend color to the belief that the delta of the San Juan is about entering upon an entirely new phase.

An important change has been going on and is still in progress in the regimen of the San Juan itself, namely the transfer of nearly all the volume of the river to the Colorado branch which empties into the sea ten miles to the southward and eastward of Greytown.

The decrease in the volume of the Lower San Juan correspondingly decreases the sediment discharged at Harbor Head and the Tauro mouth.

The sediment discharged by the Colorado has been so acted upon by the waves as to gradually force the

outlet of that river to the southward until at present the waves either beat perpendicularly upon the beach or have a slight southerly resultant.

With the supply of sediment cut off in the vicinity of the delta, and the waves still sweeping diagonally along its northern side, one natural result will follow, viz. : the sand will be cut from the point or eastern half of the delta, and swept into the bight to the westward until the delta is destroyed, and the coast line rectified and hammered into a line normal to the waves.

It would seem that the beginning of this stage had already been attained. The barrier outside of Harbor Head has been eaten through and transported to the westward, and Harbor Head is filling up. The break-water proposed for the restoration of Greytown Harbor will probably modify this rectification to the extent of limiting it to the coast line south and east of the break-water, leaving behind it a secure and permanent basin entirely removed from fluvial influences or dangers.

The scenery of the Lower San Juan and about Greytown, when no silico palms are visible, is no more tropical in character than that of our southern rivers, or the marshes of the St. Mary's River and Cumberland Sound.

From the bifurcation of the Colorado and San Juan to the mouth of the San Carlos, where the river is broad and the luxuriance (in *minutiae*) of the vegetation of the banks is not perceptible, the effect as one looks along one of the river reaches is not more tropical than that of a Middle State or even New England river in July or August.

Through the Agua Muerta, and for most of the distance between Castillo and Toro, there is, however, no

lack of tropical effects. The huge trees hang covered with luxuriant vines, which twine among the branches, and then fall to the water's edge in dense, heavy curtains, till they form a continuous vertical wall relieved with bastions and flying buttresses.

Above Toro the scenery is even more tropical. Close to the water runs a band of brightest green grass; over this droop the feathery fronds of an unbroken row of palms, and beyond and above the palms towers the fine-cut foliage of great hard-wood trees.

From Greytown to the San Carlos there are now many clearings along the rich bottom lands of the river, the land about the mouth of nearly every tributary having been thus improved. Some of these clearings extend for a mile or more along the river, rich with plantains, bananas, oranges, limes, cacao, coffee, cane and vegetables.

The mouths of these streams offer a secure retreat and harbor for canoes, and the stream itself is a highway to the interior for the hunt, or for *hule* (rubber), or for bringing out the new cedar canoe.

Then over the neighboring spur of hills runs a well-worn trail back into the forest, along which the hunter takes an occasional trip, returning loaded with *chanchos* (wild pigs), *pavon* and *pavo* (wild turkey).

The productiveness of these rich lowlands, when once the flood-waters of the lower river are controlled, and they can be effectively drained, will be wonderful. Below the mouth of the Sarapiquí, and also at Ochoa below the San Carlos, and at Castillo, are large numbers of cattle, and as they gather at the river at night and morning, or feed over the hills during the day, they give a very pastoral air to those localities.

At Castillo there is a village with a population of some hundreds, the picturesque old castle crowning the hill above the village.

The Nicaraguan custom-house is here, and all goods are transferred at this place. There is also something of a garrison in the castle.

At the mouth of the Závalo, just above Toro, there are two or three houses, a depot for supplies for the mines located up the river. At this point also there are thermal springs reputed to be good for rheumatic troubles.

Ft. San Carlos, at the head of the river, is a village of a few hundred inhabitants. There is a garrison here, but the old fort is in ruins.

The scenery of the Upper river is but little changed by high water or low water. In the Lower river there is a marked difference.

In the dry season there is a fringe of grass close to the water's edge, and all the islands have grassy points reaching up and down stream. Banks of yellow sand, favorite haunts of alligators, occur at every bend. Where the banks are vertical, the deep brick red of the clay underlying the soil appears, and at the base of all the spurs which come to the river their bed-rock foundations show. In the rainy season all these features disappear, and the river runs between full banks with the drooping vines trailing upon the water. In March and April these vines put forth their flowers, which hang in long yellow and pink and white festoons. Up in the great cottonwood trees the purple Flor del Toro shows itself, scarlet passion flowers light the woods, the Ibo trees are a solid mass of red flowers, which hide the leaves

entirely; and another tree, the name of which I do not know, is equally intense in yellow. Then there is a fine white flower growing among the underbrush, which scents the air as with honeysuckle. Along the banks and on the sand-spits running out from the islands, and among the zacate and gramalote grass, grow countless aquatic flowering plants.

Animated nature along the river vies with inanimate in abundance and variety. Though the denizens of the river and the forest can by no means be said to be shy, yet passengers on the steamers have not the opportunities for observation of one traversing the river in a canoe, gliding noiselessly along close under the banks.

If the day be bright every turn in the river shows up a brown, mud-encrusted alligator lying upon the bank, and others poke their ugly snouts above the water.

The triangular fins of sharks may be seen cutting the water here and there: a sudden swirl in the water and a V-shaped ripple moving swiftly away from the canoe marks a startled *tarpon* disturbed at sunning himself in shallow water.

The alligators and sharks, though numerous, I do not consider dangerous. I failed to learn of any authentic instance of their having killed any one, and I have repeatedly seen natives bathing in the river almost literally in the midst of several of the latter.

If near the rapids the river will be full of leaping *závalos*, offering fine rifle practice. Just after sunset a *danta*, or deer, or manatí, is very apt to be seen crossing the river.

White and blue herons stand along the banks or soar lazily from point to point. Macaws, parrots and parro-

quets scream in the trees; *zopilotes*, or buzzards, circle high in the air; an occasional hawk darts swiftly from bank to bank; black and red and black and yellow songsters and trogons flit along the banks:

The sharp eyes of the boatmen detect every now and then a huge iguana hugging a branch above, though sometimes the first intimation of his presence is a splash as he drops into the water from a height, and with a force that it would seem must burst him. Innumerable smaller iguanas, of bright metallic hues, and with ugly spinal fringes, bask upon the white snags and logs which lie in the water near the banks, and when disturbed dart for the shore, moving their feet and tails with such rapidity that they actually walk upon the water, often for a distance of several yards.

Sometimes a dry branch falling in the boat reveals the presence of a troop of monkeys in the trees overhead. These fellows make grimaces, break off dry branches and throw them down, and shake others as if in uncontrollable rage, until a rifle bullet brings down one of the fattest for the boatmen's dinner, and sends the remainder screaming away into the woods.

Perhaps a little farther on a musky odor shows the presence of *chanchos*, or wild pigs, on the bank above, or some of the men may hear them feeding, and it is usually only a matter of a few minutes to bag one of them.

The air above the great river is never silent. From the first suspicion of morning light, when the bull-voiced *congo*, or howling monkey, wakes the forest with his bel-lowings, to sunset, when the shrill whistle of the *gongolona* marks the hour of six, wild pigeons, macaws, song-

birds and monkeys have their turn. At night equally numerous sounds fill the air; the grunting of alligators, the splash of leaping fish, the screams of tigers, and the cries of nocturnal birds and beasts. Then all at once a heavy booming noise, like the distant report of a cannon, breaks through the night air and reverberates along the river; it is the death-note of some giant of the forest which has crashed to the earth, carrying with it everything in its reach.

Or it may be that lying awake upon a sand bank in the river a low whisper comes from the northeast; this increases to a murmur, then to a sound as of surf upon a distant shore. You look to the rubber blanket over you, roll yourself carefully in the one beneath, and by this time the murmur has become a roar. In a moment the bank of the river disappears, and in the next instant the pelting of the big drops upon the blankets, and the hissing of the dry sand as it absorbs the deluge of the tropical shower drown every other sound.

The scenery of the San Juan is more than difficult to describe. From the day when Diego Machuca (1529) floated down its bosom to the Atlantic until now, every traveller upon the noble river has been struck with its wondrous beauty, and wasted words trying to render the impressions it made upon him. It is impossible to do it justice, and it is almost equally impossible to abstain from enthusiastically making the attempt. There are such contrasts. There are days and days upon the river, and there are indescribable nights; days when the turbid water is indistinct through the gray driving rain, and hisses with the impact of the big drops, the tops of the trees hidden in clouds and the banks sodden and



slippery : and days when the vivid greens, waving trees, glistening water, the cool wind sweeping now up, now down the stream, filling the nostrils with fragrant odors, the songs and cries of numerous birds, and the native canoes traversing the river, all steeped in exultant, tropical sunlight, form a wonderful sensuous symphony.

Nights when through the blackest of darkness the men at the paddles, silently and with heads bent to the pouring rain, force the canoe along, every nerve and muscle alert to avert disaster from contact with the frequent snags and logs that project from the banks.

Nights when the Southern Cross and the Northern Bear look down upon the camp on the sand-bank in mid-river ; when brilliant moonlight falls on the softly-flowing river ; when the forest walls on either side stand out as clearly as by day ; when the palm trees glisten like stacks of burnished sabres, while in their hearts crouch blackest shadows.

But it is at the close of day that the noble river flowing from out the crimson and yellow glories of Pacific sunsets, through miles of emerald walls to the Orient mists of the Caribbean, puts on its most royal attire. Then comes the glory of the day ; from the sky descends a flood of rose, of yellow, of pale green light ; from out the flowing river rise other rose and amber and pale green, quivering lights to meet it. In darkest emerald and blackest velvet shadows the great trees rise, sharp etched, against the western sky, with tufts of moss and leaves and rope-like vines, and many of them take on strange forms, here a face, a demon of the jungle, there a majestic stag's head, and there a lithe swaying shape, a naiad of the tropics. From out the

strange, dark forest comes a cloud of fragrance, and the sound of countless birds and beasts and insects.

Then the colored lights fade, but the fragrance and the cries linger, and the white radiance of the moon falls on the noble river.

Back from the river, in the "mysterious wilderness," the "dark forest," the "unknown jungle," of various writers, there are countless objects of interest to those who do not tire easily, and who do not mind a little bodily discomfort. In these forests grow great cedar, almendro, guachipilin, ceiba and cortez trees, their heads towering far up into the sunlight, their bases buried in a dense undergrowth, through which meander the various tributaries of the San Juan. In the upper portion of the river these tributaries are clear, cool mountain streams, rippling over polished rocks and yellow, pebbly reaches, or tumbling in white spray over ledges of black trap.

In the lower river it is necessary to ascend the streams through several miles of rich bottom lands before the mountain section is reached.

Many a memory vignette of varied scenes and adventures in these forests rises before the writer, but want of space precludes a reproduction.

The days along the San Juan are apt to be hot, *i. e.*, 85° to 90°, but the nights are invariably cool, a heavy flannel sleeping suit and a woollen blanket being found very necessary for comfort between midnight and day-break.

As to health, the valley of the river is, with proper sanitary precautions, as healthy a locality as any in Nicaragua or any other country. Colds and their allied

complaints are unknown, and as for malaria, it has been my experience that with good food, regular habits, mosquito bars and coffee, it is a myth. The night, popularly supposed to be the worst time in which to be exposed, was the time frequently selected for travelling upon the river, in order to avoid the heat and glare of the day. To save time I have repeatedly spent several successive nights upon the river, sleeping as best I could in a small canoe, the intervening days being spent in the woods reconnoitering, and have experienced no ill effects.

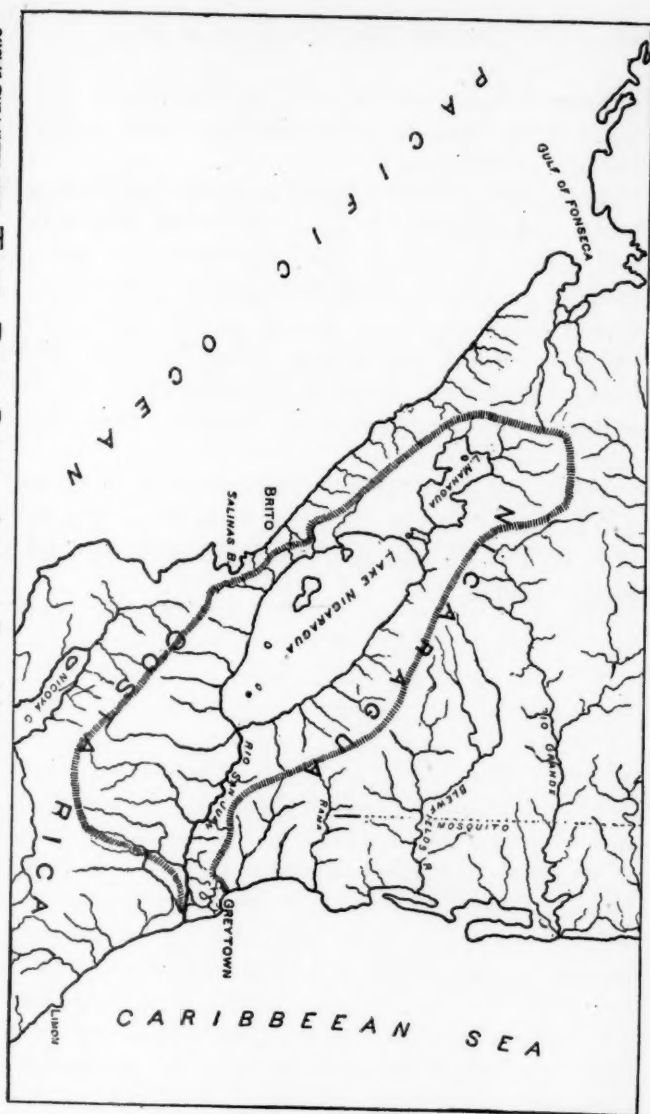
The mosquitoes so lavishly described by some travellers are by no means the unavoidable torments that many suppose. During the day there are absolutely none, and at night, if camped on a sand-bank in mid-river, or travelling in canoe, they give no trouble. If camped upon the bank a bar is indispensable, but then no one who understands anything about travelling in these countries ever goes without his bar, and it is not the slightest trouble to keep the torments out of this.

The maximum temperature noted on the river during six months, from the middle of Dec., '87, to the middle of June, '88, was 92°, the minimum 64°. The water of the river, though warm and often muddy, is pure and sweet, and, after it has settled and cooled itself in the earthen jars of native make, is by no means disagreeable.

Some reader may ask, How does it happen that in a country so little known in geographical detail as the interior of Central America, there exists such definite knowledge of this river?

It is because from the time men recognized the fact that there is no natural strait across the American

FIG. 1. SHOWS THE WATERSHED OF THE RIO SAN JUAN DE NICARAGUA



Isthmus, it was seen that at Nicaragua nature had indicated in the most unmistakable way where an artificial passage should be cut.

Twice, as we have already seen, the noble river has borne a rich commerce upon its bosom, once with the tide setting eastward, once westward; and for years, through every vicissitude of despotism intrigue and perverted judgment, it has waited for the day, certain as the recurrence of the seasons, when, between its fertile banks, the stream of the world's commerce shall flow eastward and westward, from ocean to ocean, in constantly increasing volume.

Unless all signs fail this time is close at hand, and in a few years the San Juan and Lake Nicaragua will be alive with white sails and the throbbing propellers of a mighty traffic.

## THE RUSSIAN TRAVELLER PRJEVÁLSKY.

BY

EUGENE SCHUYLER.

On the first day of last November (1888), according to our calendar, General Nicholas Michailovitch Prjeválsky (this name is properly transliterated Przheválsky, but it is best to follow the received English and French spelling) the great Russian traveller, the explorer of Eastern Central Asia, and probably one of the last of the adventurous travellers, died of typhoid fever in the little town of Karakól on the road from Vierny to Kashgar. In his last moments he asked to be buried on the shore of Lake Issyk-Kul, in a spot which, surrounded by mountains covered with eternal snow and close to the blue waters of the lake, presents itself as vividly to me now as when I first saw it 15 years ago.

Personally, I met Prjeválsky but twice ; once when he spoke before the Imperial Russian Geographical Society at St. Petersburg in 1874, when he received the gold medal ; and a few days afterwards at the house of a friend. But even before that his name was known to me from his travels, and since that has become familiar to every one who interests himself in the geography of Central Asia.

Before speaking of his work as a traveller and explorer it is interesting to touch on his early life ; and for this we fortunately have some auto-biographical sketches

written in 1881, and recently published in the *Rússkaya Starind.*

Prjeválsky was born on April 12, 1839, in the little village of Otradnoe in the Province of Smolensk. He was the eldest son of a family comprising two other sons and a daughter, and was left fatherless at the age of seven. Although of Catholic and Polish origin his parents both belonged to the Russian Orthodox Church. His mother was a woman of strong character, strict and severe, who believed in the rod as the best method of bringing up children. As the family possessed about 3000 acres of land and 135 serfs, they were neither rich nor poor. Prjeválsky's early education was, as was the custom of families in those days, conducted entirely at home, with teachers competent and incompetent—most of them young theological students sent out from Smolensk. He was a wild, unruly child, always escaping to the woods, his passion being sport. When he was ten years old he was sent with his brother to the high school or gymnasium at Smolensk, where he was left under the charge of a tutor, who took him to school, carried his breakfast to him, and then brought him home and strictly supervised him. At that time teachers in the country schools in Russia were not always up to the mark, and were frequently coarse and brutal; and these boys, in common with others, suffered much. Prjeválsky says however that one advantage was that they all remained boys and did not ape the fashions of men as school-boys do nowadays; and as their summer vacations were very long—because it was always necessary to repair or alter in some way the school buildings—they were enough at home to prevent their being spoiled by town life. His



earliest reading was about travels and adventures, but he was such a "bad boy" according to contemporary ideas, that all his mother's friends advised his being put into the military service and sent off to the Caucasus, whither all bad boys were sent at as early an age as possible. Nevertheless he did well at school, and was the first scholar in his class; although he nearly spoilt his career by taking part in a school rebellion a few days before he left it at the age of sixteen. He had then decided to enter the military career owing, as he says, to having read a book called "The Fearless Warrior," which gave him the conviction that this was the only way of being really virtuous and a benefactor to his kind.

In September, 1855, just as the Crimean War was ending, he went to Moscow as a *Yunker* in a Biélefsky Regiment. A *Yunker* at that time, as now, was something between an officer and a soldier. As belonging to the nobility he was on equal terms with the officers, but in all other respects—food, quarters and discipline—he was on a level with the soldiers. Soon after he joined his regiment they went on a march. "I had," he says, "about forty companions of all sorts of rascals, some of whom, on the very first day, stole some boots and got drunk in a tavern. This worked on me very much, and at first disenchanted me with the military service. I used to go shooting in the woods, and often wept there. The idea came to me then, that perhaps I could get out of it in some way by going into the Military Academy. My regiment at this time was stationed in the province of Tula, and the peasants constantly turned to me with the question, 'What is the matter with you to have been sent as a soldier so young?'"

He did not like the *Yunkers*, who were his comrades, and to whom the officers then paid no attention, and who were besides so brutal in their relations with the soldiers that, although he was habituated to the customs of serfdom, his feelings were revolted, and his only solace was in shooting in the woods, in studying the habits of animals and botany, of which he had got some knowledge at school. In the summer of 1856 his regiment moved to the town of Kozlóf, in the province of Tam-bóf, and were a mere band of robbers, because generally nothing was bought either for men or horses. "Everything was obtained free. Turns were kept in this, and once, when my turn came, I remember that I killed a turkey with my bayonet, which we afterwards ate in camp." Soon afterwards he was made an officer, and sent to the Polótzk regiment in his own province of Smolensk, by which he was able to go home and bring one of his serfs as a servant, who was an excellent sportsman, and who by some means was always able to supply both him and his horses with food, free. At this time, as he had no liking for the dissipated life led by the officers, he read many books of history, travels and novels, and first got the idea that it was his duty and his fate to become a traveller. He petitioned the commanding officer to be sent to the Amur, which, owing to its recent occupation by Russia, was uppermost in the minds of all, the result of which was his being placed under arrest for three days; and this decided him to enter the Staff Academy. He busied himself with his studies alone, for at the time there were no educational facilities offered to an officer; and when he thought that he was nearly prepared, he was much put back by

the advice of one of his friends to learn the Military Code by heart, as this would be the chief subject of examination. This he found utterly repulsive and impossible, but nevertheless he went in August, 1861, to St. Petersburg—a city up to then entirely unknown to him, and found himself without money, but succeeded in passing the preliminary examination with credit, for, fortunately, the questions on the Military Code were not difficult. At first he had hard work to get on, and often went without his dinner. He read up his favorite subjects, and tried to make some money by writing. One article, "The Recollections of a Sportsman," was accepted by a leading journal; but he was paid nothing for it, on the ground that it was not customary to pay for the first article. As his theme on entering the second year he took "The Amur Region," which, of course, had to be compiled from what had been published at the time; and soon after this, the Polish rebellion having broken out, offers were made for volunteers, with certain privileges. He accepted them and went back to his old regiment as an aide-de-camp. He passed in this way another year, always with his mind set on travelling; dreaming at that time of going to Africa—although when he reflected that he had no money, and on the amount that such a journey would cost, he concluded to turn his attention to Asia. A friend presented to the Russian Imperial Geographical Society his article on the Amur, and he was elected a member, and his article was printed. His finances at this time were somewhat better, and he was able to obtain books; one of them, which made a strong impression on him, being Buckle's "History of Civilization," the rest being chiefly on geography and

travel. At the end of 1864 he went to Warsaw, where, at his request, he was made a teacher in the *Yunker* school and librarian, and where for two years he diligently prepared himself for what he considered his future task by lecturing on geography, compiling a text-book, renewing his studies of zoology and botany, and when at home in the summer, collecting a herbarium. Finally, at the end of 1867, on the representation of a gentleman who was a friend of his, and at his own particular request, he was ordered as a staff officer to Eastern Siberia, and immediately started.

He remained at Irkutsk only about a month, having, meanwhile, charge of the library, and was thus enabled to post himself as to the region. He was delighted with Siberia, and when he was ordered off with a nominal commission of taking the census of the population on the river Usuri, his only discomfort was that the German friend, whom he had brought out at his own expense, had unfortunately fallen in love with some Amalia before starting, and refused to go further. Nevertheless he found another companion, and spent several months in a boat on the Usuri and Lake Khanka, and wrote a Report, which, owing to his ignorance of languages, had very little to do with the population, of whom he had formed an unfavorable opinion, and more with the natural history of the country. He was very much depressed, therefore, when his commanding officer, on reading the report, said: "I have read your whole report, but I knew the whole thing, without your saying it, that in that region it is d——d disagreeable." However, Prjeválsky sent his account to the Geographical Society and was rewarded with a

silver medal, which he considered a very slight recompense for his services : although to those who knew what other Russians were doing at the same time, it seemed a sufficiently large one. M. Seménof, at that time the Vice-President of the Society, who had himself written very noteworthy accounts of his own journeys in Asia, took up Prjeválsky's case, and in the autumn of 1870, the latter started on a journey through Mongolia, very much hampered by lack of means, as he received for his expedition only \$2000, which, however, he made last him for over two years ; and meanwhile visited Lake Koko-nor, traversed some of the regions mentioned by Marco Polo, but visited by no subsequent traveller, found the rhubarb of commerce growing wild, paused for a while in Pekin, where he took lessons in astronomy at the Russian Observatory, and would have gone into Tibet, whither he was almost invited by the Tibetan officials, but he had no more funds, and was obliged to return to Koko-nor in a state of great destitution. Ragged and footsore he went back to Siberia, with an excellent collection of objects of natural history, including birds, skins and furs, eleven species of fish, 3000 specimens of insects, 4000 species of plants, and a great number of geological specimens, besides all the topographical observations which he had made. On his return to St. Petersburg he was given the gold medal of the Geographical Society, and was received with enthusiasm. In spite of the rich result which his travels had yielded for natural history, many persons were disappointed, and I must admit that I then shared their views, at the small amount of ethnological and historical information which he had brought back, and they were

inclined to criticise the conduct of these expeditions where it was so important to learn the actual complexion and character of the population. While Prjeválsky had prepared himself for his work in an unusually careful way, he had neglected one thing, the acquirement of a knowledge of native languages, and was therefore obliged to employ two and sometimes three interpreters—that is a Cossack who spoke Tartar, some one else who spoke Mongol, and often a third. Of course, information obtained in this way could not be relied upon as entirely accurate, as I have myself experienced. It was a pity that neither the Government nor the Geographical Society was willing to spend money enough to send with the expedition one or two students of the Academy of Oriental Languages, who could have greatly facilitated the task of Prjeválsky, whom all admitted to be the leader, and the only one at the time possible to conduct such expeditions.

Prjeválsky had the personal pleasure of showing his collection to the Emperor, and was promoted to be Lieutenant-Colonel, and received the right to a pension of \$100 a year, which for a Russian officer is a large sum. More than that, he won the attention of the Grand Duke Constantine who is always awake to everything that concerns science, and who had founded the medal of the Geographical Society which had been given to him; and, by the Grand Duke's intercession with the Minister of War, he was placed on the General Staff of the Army, from which—in spite of his studies at the Academy and his services—he had been excluded, because his name was too much like a Polish one. In August, 1876, after several detentions, he was ready to start on another

expedition towards Tibet, an amount of about \$15,000 having been allotted to him, which enabled him to supply himself with all that was absolutely necessary.

He crossed the Tian Shan into Kashgaria, which was then ruled by Yakub Bek, and went into the basin of the river Tarim; through a region where no European had ever penetrated, towards the old trade route which ran near the lake called Lob-nor, mentioned by Marco Polo—a route abandoned for many ages on account of the gradual encroachments of sand and desert. He reached the frontiers of Tibet and felt confident that he could have got to Lhasa itself had he not been prevented by illness. The great geographical result of this expedition was the rediscovery of Lob-nor; and of the great mountain chain hitherto unknown, which rose immediately to the south of it. His views were afterwards criticised and combatted by Baron Richthofen, the distinguished Chinese scholar, and President of the Berlin Geographical Society, but it is now generally admitted that Prjeválsky was right, and the nearness of the lake to the mountains explains much that was hitherto hazy in the traditional geography of this region, dependent on the accounts of the old Chinese writers. He made, too, one great discovery in natural history, in finding wild camels which had been talked about for 400 years, "thin, slim, not bigger than a horse, and with two humps, with a keen scent; climbing like goats; and hunted by the natives for the sake of their wool." Of these he was fortunate enough to obtain four skins.

This was a short expedition lasting only eleven months, and was a sort of reconnaissance of the route to Tibet, like his subsequent journey of 1879-80.



When he arrived on the Tibetan frontier, after being asked whether he was English or Russian, he was begged not to advance further. He remarks in his book—which has been well translated into English by Mr. E. Delmar Morgan, who has also translated his “Mongolia,” and who, it is to be hoped, will furnish also a translation of his account of his last journey—“that it was useless for four men to combat the fanaticism of a whole nation ;” and he went back across the plains of Tsaidam to the Lake Koko-Nor. Then he tried to go to the sources of the Hoang-Ho, or Yellow River, but was unable to find his way amongst the curious labyrinth of precipices and ravines that open out on every side ; and contenting himself with his very rich botanical collections and his ethnographical observations, returned across the Alashan country by the way of Urga to Irkutsk.

The results of the last two journeys of Prjeválsky were so remarkable that he received the Humboldt medal of the Berlin Geographical Society, the great medal of the Royal Geographical Society (London), the medal of the Italian Geographical Society, and others, all of which had their influence in Russia, and enabled the Russian Society to grant him about \$25,000 for his new expedition, during which he explored the sources of the Hoang-Ho, northern Tibet, and the Tarim basin, travelling in all about 5000 miles.

The expedition consisted altogether of twenty-one persons, including Prjeválsky, his assistant, Robarófsky, whose name will, without doubt, be heard again, Koslof, and interpreters, Cossacks, soldiers, etc. He started in 1884, this time for Kiakhta, crossed the desert of Gobi

to the head-waters of the Hoang-Ho, crossing one pass of the height of over 16,000 feet, discovering many lakes on this high plateau, which is spoken of as a marshy plain, the Sing-su-hai or "starry sea" of Chinese historians,—and we can easily imagine why the great Yellow River has at times such inundations, which cause devastation through northern China, and why Embassies are sent from Peking to offer sacrifices in order to propitiate the deities controlling its course. At the height of 11,700 feet he found a great lake to which he gave the name of "Never-Freezing;" and at the height of about 14,000 feet two others, which he called the Russian Lake and the Expedition Lake. Here the attacks from the natives obliged him to descend the river; and finally crossing the range of the Altyn-Tagh he came down to the banks of the Lob-nor, where he remained for several months during the winter. Subsequently, after traversing the desert of Keria and Khotan, he crossed the Bedel Pass, 13,700 feet high and came back to Karakól in the Russian dominions where, singularly enough, he afterwards died.

He was about to start on a new expedition, indefatigable as he was, hoping this time to reach Lhasa; thinking that the English failures on the southern side might increase his chances of getting into this forbidden country of Tibet on the north—when he died. The expedition however is not given up, but will be carried on under the leadership of Colonel Pevtsov, who has already made his mark by several journeys in Mongolia, and proved himself a worthy successor to Prjeválsky.

To us, who take only a scientific interest in the geography of Central and Eastern Asia, it is amusing

to find that while the English highly approve of the political aims, and especially of the political information of the three last English travellers, on routes near and crossing those of Prjeválsky—James, Carey and Younghusband—they are much startled by the final chapter of Prjeválsky's account of his last journey, where he ventures on criticisms of the Chinese Government and officials in Chinese Turkestan, and shows the ease with which the Russians might occupy that country, and the advantages it might give to the Russian Government. Should the Russians ever find it profitable to themselves to occupy this inhospitable and barren waste, either for repressing disorders on their frontier, or for approaching nearer to India, it will perhaps be due not so much to the travels of Prjeválsky—great as their results have been—as to the labors of Mr. Nicholas Petrófsky, who, after a career of many years in Tashkent, has been for ten years past the Russian consul in Kashgar.

If any practical inference may be drawn from Prjeválsky's expeditions, it will be to show what great results can be obtained from an economical expedition, so long as it is under good leadership, and for this Prjeválsky had shown every quality; and by an explorer who has especially qualified himself for the task as Prjeválsky had done. It might be as well, therefore, for us to consider whether we could not do better to explore our continent for ourselves, whether North or South America, rather than leave the greater portion of the task to English, French and Germans.

## GEOGRAPHICAL NOTES.

---

GEOGRAPHICAL SOCIETIES AND JOURNALS.—In the *Geographisches Jahrbuch*, vol. 12, Mr. H. Wichmann gives the statistics, past and present, of geographical societies and periodicals throughout the world.

The parent Geographical Society is that of Paris, founded in 1821.

In 1830 there were 3 societies; in 1840, 4 had been added; in 1850, 3 more; in 1860, 6 had been added and 1 had been dissolved; in 1870, 11 new ones had come in; in 1875, 13 new societies had been formed, and 3 had ceased to exist; in 1880 there were 31 new names; in 1885, 43, and in 1888, 10; while the extinctions were, for 1880, 3; for 1885, 10; and for 1888, 6.

The Societies now in existence number 101, with 44 branches, distributed through 21 countries and 135 cities. France heads the list with 29 societies and 19,800 members. Germany comes next, with 22 societies and 9200 members; then Great Britain (and the British Empire), with 9 societies and 5600 members; Italy with 4 societies and 2550 members; Austria-Hungary, with 2 societies and 1950 members; and the United States, with 3 societies and 1500 members. In the number of societies, Switzerland with 6, and Russia with 5, would take precedence of Italy; but the total Russian membership is only 1330, and the Swiss 1000.

The largest single societies are the Royal, of London, with 3391 members; the Paris, with 2184; the Paris Commercial Geographical, with 1560; the Vienna Imp. Royal, with 1364; the American, with 1309; the Italian, with 1232; and the Berlin, with 990 members.

Of the societies divided into sections, or branches, the largest is the Berlin *Zentralverein für Handelsgeographie*, with 10 branches, and a total membership of 3200; then follow the Lille *Société de Géographie*, with 4 sections and 2027 members; the Paris *Société de Topographie*, with one section and 1165 members; the Bordeaux *Société de Géographie Commerciale*, with 7 sections and 1120 members; and the *Scottish Geographical Society*, of Edinburgh, with 3 sections and 1102 members.

The geographical journals, which numbered 126 in 1885, are now 130 in all. Of these 45 are published in French, 41 in German, 10 in English, 9 in Russian, 6 each in Italian and Portuguese, 5 in Spanish, 3 in Dutch, and 1 each in Danish, Swedish, Hungarian, Roumanian and Japanese.

Mr. Wichmann thinks that the geographical character, and even the existence, of some of these societies and journals may be seriously doubted; but he does not believe there is any falling off in the general interest in the subject of geography.

However this may be, it is certain that the activity in the formation of new societies during the decade 1876-1885, when 74 were founded, was nothing less than feverish; and the slower progress of the last four years must be taken as an indication of a healthier state.

A CORRECTION.—In the *American Antiquarian and Oriental Journal*, for January, Dr. Daniel G. Brinton criticises Mr. Thomas de St. Bris and his *Discovery of the Origin of the Name of America*, in the following words :

"The year 1888 was fruitful in follies of Americanists, so-called, and here is another to add to the list. It appears under what we presume is a pseudonym ; but on the title-page bears the assertion that it was read before the American Geographical Society. If that is so, it is a pity that so respectable a society gives opportunities for the display of such ignorance and folly. . . . But we cannot close without expressing our wonder and sorrow that such respectable journals as the *Popular Science Monthly*, the *Critic*, the *New York Times*, etc., would lend their approval to such flagrant misuse of authorities and dense ignorance of the subject. Is it not obvious to any one that since the natives had no idea of the continent as a whole, that they could not have had a name for it ?"

It ought to be said that the American Geographical Society never heard of Mr. Thomas de St. Bris until his book, with the unauthorized announcement on its cover, was received at the library. It appeared soon after this that he had written, under the name of T. H. Lambert, a paper which will be found in the *Journal* of this Society for the year 1883 ; and those who have the time and the courage to read the two publications will find no difficulty in arriving at the conclusion that Mr. Lambert has a prior claim to all the folly and ignorance which Dr. Brinton discovers in Mr. de St. Bris. In any case this Society declines to be responsible for the one or for the other.

A DEADLY GAS-SPRING IN THE YELLOWSTONE PARK.—Mr. Walter H. Weed writes from Washington to *Science*, of February 15, that last summer he discovered in the extreme north-eastern portion of the Yellowstone Park, on Cache Creek, two miles above its confluence with Lamar River, a spot where fatal gases come out.

The ravine, or gulch (it is called "Death-Gulch,") begins in a basin about 250 feet above Cache Creek, and just below this basin was found the fresh body of a silver tip grizzly bear, and above this the body of another, long dead. Near by were the skeletons of other bears and an elk, and in the bottom of the pocket, or basin, the fresh remains of squirrels, hares, and other animals, besides dead butterflies and other insects. There was no trace of violence in any of these remains, and the animals had clearly been asphyxiated by the noxious gas.

In the narrow and steep ravine there can be no accumulation of dead bodies, for the rush of the water, after heavy rains, must sweep everything before it.

The place abounds in sulphur, the channel is cut in beds of dark gray volcanic tuff, and the clear, cold stream at the bottom is sour with sulphuric acid.

THE LAKE GLAZIER FICTION.—"The evil that men do lives after them." Capt. Willard Glazier has long been dead and buried, for all serious men, but his story of a Lake Glazier, found by himself to be the true source of the Mississippi River, is still accepted in some parts of the world as an authentic narrative.

The *Revista* of the Argentine Geographical Society is the latest victim of this mystification, which owes its continued vitality to the Royal Geographical Society of



London. That Society, in a spirit of trustfulness worthy of respect, published in its *Proceedings* for January, 1885, the letter and the map which Capt. Glazier offered as proofs of his achievement. Recognised in this way by a Geographical Society in good standing, Capt. Glazier was enabled to persuade himself and some other persons that he had done something. Unfortunately for him, before he had passed from the scene his romance was taken up by two competent geographers, Mr. Russell Hinman, of Cincinnati, and Mr. Henry D. Harrower, of New York. Mr. Hinman, in a letter to *Science*, of Aug. 13, 1886, showed, with corroborative maps, that Capt. Glazier knew nothing of the Mississippi, and that he had published as his own several passages and a complete table of meteorological observations, from the work of Schoolcraft, printed in 1820. Mr. Harrower, in a pamphlet dated October, 1886, added a number of maps to those given by Mr. Hinman, and reproduced from Schoolcraft's book the table of meteorological observations which Glazier, by a process of unconscious cerebration, sometimes called by a harsher name, had brought forward as his own.

The date assigned by Glazier to his reputed discovery and voyage was the year 1881. It was shown by Messrs. Hinman and Harrower that the head-waters of the Mississippi had been correctly laid down long before in the map published by the United States Land Office in 1879.

These facts were summarised and correctly stated in this Society's Journal, for 1886, and they ought by this time to have reached Buenos Aires, and even London. It can do no harm to repeat them now for the benefit of

those who continue to believe in the existence of Lake Glazier and its discoverer.

THE NAME OF VESPUCCI.—The January number of the *Bollettino* of the Italian Geographical Society states that in November last Mr. G. Govi laid before the *Accademia de' Lincei*, in Rome, a letter written by Vespucci to Stanga, the Milanese Commissioner at Genoa, under date of Seville, 30 December, 1492. The signature reads: *Amerigho Vespucci*.

The authenticity of the letter is practically established by the handwriting, the turn of expression and the subject, and also by the fact that Mr. Govi discovered it in the Gonzaga Archives, at Mantua, together with other documents that refer to it. It mentions by name the Mantuan Ambassador Salimbeni.

The discovery of this letter will grieve, but cannot dishearten, the ingenious persons who have proved to their own satisfaction that Vespucci and Waltzemüller invented the name *Amerigo* after Columbus's Fourth Voyage, 1502-1504.

THE INTERNATIONAL GEOGRAPHICAL CONGRESS AT PARIS.—This Congress will be held in the week of the 5-11 August, 1889, at the Hôtel de la Société de Géographie, 184 Boulevard Saint Germain. One special meeting will take place in the hall of the Trocadéro, offered by the Directors of the Exposition for the use of the scientific and learned societies.

It is hoped that the French railway companies will establish reduced rates of fare for members of the Congress.

There will be six groups of subjects for deliberation and discussion :

- I. The Mathematical : Geodesy, Hydrography, Topography, Cartography.
- II. The Physical : Meteorology and Climatology, Geology, Botanical and Zoological Geography, Geography of the Oceans, Ethnography, Medical Geography.
- III. The Economical : Commercial and Statistical Geography.
- IV. The Historical : Historical Geography, History of Geography and Cartography.
- V. The Didactic : Instruction in and Diffusion of Geographical Knowledge.
- VI. Travels and Explorations.

Communications and questions for discussion, if sent in early, will be referred to the proper committee, each committee, at the same time, reserving the right to draw up a programme of the questions properly belonging to its own province. These programmes will be distributed without delay.

One request made by the Committee on the Organization of the Congress does not seem to have been made with deliberation. It is asked that each Geographical Society prepare an account of the travels and the publications which have most largely contributed to the progress of Geographical Science during the XIX. century in the country or district represented by the Society. This account is to embrace a list of travels and voyages, with their dates, the names of the countries visited, the discoveries made, and the movements, industrial and commercial, to which these travels gave

rise. Sketch-maps and itineraries are to be added, and also a bibliographical Index of works on geographical subjects, written by the scholars of the country under consideration.

These accounts, once made, are to be arranged by a Special Committee, and finally published as a History of Geography in the XIX. Century.

There will be few persons disposed to undertake, on short notice, such a task as the one proposed by the Committee on Organization ; and the usefulness of the work, even if accomplished, is open to question. No one account, so prepared, could fail to be partial and fragmentary in spirit and in performance, and not even the *imprimatur* of the International Congress would avail to give it authority.

THE ASCENT OF ARARAT.—Mr. Jules Leclercq, of the Royal Belgian Geographical Society, met at Tiflis in September last two students of the Moscow University, Messrs. Markoff and Kovalevsky, who had just returned from an expedition to Mt. Ararat.

At Mr. Leclercq's request they wrote an account of their adventures, and this is published in the *Bulletin* (1888, No. 6) of the Brussels Society.

Mt. Ararat stands in N. Lat.  $39^{\circ} 42'$ , E. Long.  $43^{\circ} 38'$ , where the frontiers of Russia, Turkey and Persia meet.

It has two summits, the Great Ararat, to the N. W., and the Little Ararat, to the S. E., with a distance of 7 miles between them.

The measurements of the Great Ararat make it, some more, some a little less, than 17,000 feet in height. Gen. Chodzko, who spent five days on the mountain

while conducting the trigonometrical survey of the country in 1850, fixed the altitude at 16,916 feet. Little Ararat is about 4000 feet lower.

The Moscow students and their party made the ascent on the 12-13 (24-25) August, on horseback, to the height of more than 10,000 feet, and the rest of the way on foot.

By half-past three in the afternoon of the first day they had reached the elevation of 12,200 feet, and two hours later stood on a little platform of rock 1000 feet higher. Here they passed the night, suffering a good deal with headache and nausea from the effects of the rarefied air. The temperature was about  $19^{\circ}$  Fahr. At 5 a.m. they took up their task again. Soon after starting they passed a conical rock on the south-eastern side of the mountain. This rock, Mr. Markoff thinks, stands on the snow-line on the S. E., at about 13,500 feet.

The path led at times across sandy tracks covered with gravel, and two of the party gave out and returned. One of the guides saw a pole planted at some distance ahead, and proposed to make use of it to prepare some tea. A halt was made, and Mr. Markoff fell asleep. When he awoke the tea was ready, and there were but two small pieces of the pole left. On one of these were the Russian letters, C. B. (S. V.), and on the other, H. K. (N. K.)

The weather was magnificent, with a clear sky and a light breeze from the south.

At 14,800 feet Mr. Markoff found among the stones a live lady-bird, of a brilliant red, and at 15,500 feet there were flowers growing on a little heap of sandy ground. At

16,000 feet the thermometer in the sun marked  $72^{\circ}$  Fahr. When the top was nearly reached the wind, blowing from the left, brought with it a strong sulphurous smell. It was 2 P. M. when they stood at last on the summit. The mountain was covered with a bed of snow, divided by a precipice that began at the summit level on the N. E., and sank toward the S. W. Here Mr. Markoff found on the hard, dry snow another lady-bird, less brightly colored than the first.

The view was obscured by mists on the horizon; but, according to Gen. Chodzko's report, the eye takes in on a clear day both Kasbek and Elburz (the latter 280 miles distant) to the N., the Black Sea, 160 miles away to the W., and the Caspian, 200 miles to the E. Mr. Bryce, in 1876, made out, more than 200 miles to the S., "the faint blue tops of the Assyrian mountains. . . that look down on Mosul and those huge mounds of Niniveh, by which the Tigris flows."

The first recorded ascent of Ararat was made in 1829 by Prof. Parrot, of Dorpat University. Since then the feat has been accomplished eight times, but devout Armenians firmly believe that the sacred mountain-top is inaccessible to man.

A CURIOUS DOCUMENT.—There appears in the *Journal of the Manchester Geographical Society*, Vol. 4, Nos. 1-6, pp. 191-193, what is meant to be the translation of a letter from the Portuguese Minister of Marine to the Lisbon Geographical Society.

The letter has for its subject the development of the Portuguese African colonies, but the English in which it is expressed is more precious than Mossamedes and

Mozambique. Pedro Carolino is at last justified of his children, for here is a translator who can rival the finest phrases of "The New Guide." He says of the Lourenço Marquez Railway: "This is an urgent necessity, and imperative of the Government, the which finds itself firmly disposed to attend to without any delay."

The Minister's views regarding the east and west coasts are set before the reader in these words:

"It is not possible to apply an economic legislature which has every reason to be for Angola.

"We can, and ought to, treating as much as possible to naturalize the colony, for which she offers precious elements, facilities on par of this frankness, the navigation of the Zambezi, to establish moderate duties on customs for the transit of merchandise destined for the interior, and make a return possible of the enormous mineral riches of the province."

It appears, farther on, that there is another step to be taken, and that the "Portuguese Government has not refused to advance it by itself, but for this it cannot contain the responsibility in the maintenance of a restrictive policy, which an alien word of absolute justice will make it fall in a moment."

The passages quoted, and many more like them, are seriously presented to the English public as the composition of a statesman in possession of his senses; and it remains a mystery how such gibberish could find its way into print.

CONVERSATIONS WITH STANLEY.—Mr. Woldemar Kaden "communicates" to the *Deutsche Rundschau für Geographie und Statistik*, for January, an article in



which Prof. Paolo Mantegazza writes of his conversations with Stanley.

The first of these was with a beautiful Countess, to whom Mantegazza showed the traveller's photograph. The face, she said, was full of energy; and when told whose face it was, she cried out: "Oh! then Stanley cannot possibly be dead. He cannot die!"

The next scene was at Berlin, where Mantegazza and Baron Negri took part in the Congo Conference. They were together when they met Stanley for the first time. Negri, old in years but full of youthful ardor, rushed forward to embrace the great explorer, who drew back with a forbidding look upon his face.

Then Mantegazza began to express in his broken English the emotions which he and Negri felt at the meeting. There was no response from the "Father of the Congo;" and Mantegazza tried German with the same result. "Our Italian enthusiasm" he says, "broke against the granite in this man of the north;" and yet granite does not seem to be the proper word.

The third conversation was really the first. Mantegazza sat by Stanley's side, at the dinner given by the Emperor to the delegates to the Conference. He tried a little flattery. "What a thing it is," he said, "to sit here at the same table with the lord of Europe (Bismarck) and with the greatest traveller of our century!"

"Oh! replied Stanley, you Italians have great travellers."

"Do you mean Columbus?"

"Columbus, certainly; but I think that Marco Polo is perhaps greater than Columbus."

Mantegazza asked whether Stanley was English or American.

"By birth" was the answer, "I am an American, but in feeling a cosmopolitan."

Stanley ought to know best, but the dictionaries make him a Welshman. Be this as it may, he interested Prof. Mantegazza to the point of making him prophesy with the Countess: "Stanley cannot possibly be dead. He cannot die!"

A NEW LAKE IN AFRICA.—In *Petermann's Mittheilungen*, Band 35, Nr. 1, Mr. H. Wichmann sums up the results of Count Teleki's expedition to Central Africa. After a two months' halt on the Baringo Lake, the expedition, on the 10th February, 1888, set out on a sixteen days' journey across the Leikipia plateau, from 8000 to 9000 feet high, and on the 6th March arrived in  $2^{\circ} 20'$  N. Lat., at the southern end of a great lake previously unknown, the Basso-Narok, or Black Lake, to which Count Teleki gave the name of Rudolf. The surrounding formations are volcanic and bare of vegetation at the point reached, so that the advance to the N. was made along the eastern shore, and on the 7th April the explorers came to the northern end of the lake, in  $4^{\circ} 45'$  N. Lat. The waters were full of hippopotami and crocodiles, and abounded in fish, the principal food of the scanty population. In the 54 days' march only two small settlements were seen. To the east of the northern end of the lake lies another, smaller and saltier, and to this, the Basso-na-Ebor, or White Lake, was given the name of Stephanie. The farther progress to the N. was stopped by the rainy sea-

son, which laid the whole country under water. The expedition returned along the eastern shore of the Basso-Narok, and reached the Baringo Lake on the 29th July, after a circuitous march through the country of the nomadic Turkana and along the dry bed of the Trguell River. There was no game to be had, and the carriers were obliged to live on berries and such plants as they could find. The coast of the Indian Ocean was reached at last, on the 25th October, near Mombaz.

AFRICAN SLAVERY AND THE ARABS.—In the *Deutsche Kolonialzeitung*, No. 47, 1888, Mr. Paul Reichard gives the result of his observations on African slavery. He says in the first place that the native Africans maintain the trade much more than the Arabs, and that both misunderstand the European interference with it. A noteworthy fact is that from 80 to 98 per cent. of the genuine negroes are slaves, none but the chiefs and their relatives being free. Of the semi-nomadic tribe of the Wahähä nearly half the people are slaves; while among the Somalis and the kindred Masai there are almost none. In Igonda, the capital of Ugunda, there were in 1880–1885, 6 freemen in a population of 500 or 600, and in Kakoma, out of 60 or 70 persons, 3 were freemen. In Mr. Reichard's own caravan, composed of 350 men, all but 3 were slaves; and when, on his return march, he was joined by 300 others who wished to take advantage of his protection, only 2 of these were freemen.

It follows that slaves must be well treated, first, because the owner is naturally interested in his property, and secondly, because the slave, if abused, has only to run away and become a slave elsewhere.

The origin of African slavery is to be sought for, not in the oppression exercised by the chiefs, but in the universal insecurity and defencelessness of persons and property, so that the institution is rather a benefit than an evil ; and Mr. Reichard has never heard that any slave had been known to lament his bondage.

Mr. Reichard's reasoning shows that he has kept his nature unspotted from the world, and is more guileless than any one but a slave-owner or a chief. Other men find it difficult to understand how there can be universal insecurity of persons and property without something very like oppression.

The Arabs are not what Mr. Reichard calls slave-dealers. They are, first of all, traders in ivory, who have borrowed money at usurious rates of the Banians, or Indians, in Zanzibar, and find themselves unable to pay their debts.

They take refuge in Central Africa, as other defaulters go to Canada, and begin their slave-business and planting on their own account ; and, being sharp traders, they do well at both. Their ways are intelligible to the negro, but he can make nothing of the Europeans. "They will not let us have slaves," he says, "but they have them. Look at the sailors on their ships ! Those poor fellows eat and drink and sleep at the word of command. They stand up and lie down, they run and they climb, just as they are ordered. We do better than that, for if we don't want to do anything, we leave it alone, and nobody meddles with us. Then the white men take the Arab ships with their slaves on board, that the Arabs bought with their own money, or captured at the risk of their own life ; and the whites must be very

bad men, to carry off the slaves without paying for them."

There is but one way, in Mr. Reichard's opinion, to get rid of slavery, and that is to strip the chiefs of their power, to introduce order and security, and to possess the country. This is intelligible, if not new; but who is to be the possessor?

HUNFALVY.—Dr. John de Hunfalvy, President of the Hungarian Geographical Society, died at Budapest on the 6th of December, 1888, in his sixty-ninth year.

Hunfalvy was a member of the Royal Council, a Professor in the University, and an Associate of the Hungarian Academy of Sciences, and his name was held in honor abroad as well as at home.

The Committee of the Hungarian Geographical Society speak not for themselves alone when they say: "What was perishable in him we confide to the earth, but his spirit will live in his works, even as his memory will endure in the hearts of his friends."

*The Eruption of Krakatoa and Subsequent Phenomena. Report of the Krakatoa Committee of the Royal Society.* 4to. Trübner & Co., London, 1888.

On the 17th January, 1884, the Royal Society appointed a Committee of Six, with power to add to the number, "to collect the various accounts of the volcanic eruption at Krakatoa, and attendant phenomena." As finally constituted, the Committee consisted of thirteen members.

Their work involved an immense amount of labor, which may be partly appreciated by those who consider

the closing sentences of the preface: "The Committee's first duty (and desire) was to collect facts. This duty we have all tried to discharge, and we have not only collected the facts, but have done our utmost to enable every one to verify them."

It is not in the mass of material thrown out—for in this respect other volcanic eruptions have surpassed it—but in the terrible character of the explosions that the outbreak of Krakatoa appears to have no parallel. Prof. Judd accounts for the peculiarity of the phenomena in this eruption by the situation of the volcano and its liability to great inrushes of the waters of the sea.

Of the ejected material, 5 per cent. was in the shape of compact lava and fragments from the side of the vent, and 95 per cent. consisted of pumice and dust. For more than a year after the eruption (Aug. 26, 1883), vessels sailing the Indian Ocean encountered this pumice, sometimes for days together.

The atmospheric disturbances were registered at fifty-two stations, distributed through the world.

Seven great air-waves were recorded, four outward from Krakatoa as a centre, and three return-waves. The first wave reached New York in 14 hours 35 minutes from the time of its origin, and the second 37 hours 47 minutes later; and, taking the average of all the records, the velocities were from 674 to 726 miles an hour.

To show the distances at which the sounds of the eruption were heard, Gen. Strachey makes a diagram of concentric circles drawn around Krakatoa at intervals of 10°. The 30° line is touched, or nearly approached,

by Ceylon to the N. W., Perth and other stations in West and South Australia to the S. E., New Guinea to the E., and Manila to the N. E. Diego Garcia, in the Chagos group, almost due W. of Krakatoa, and Alice Springs, in South Australia, are beyond the 30° line, and Rodriguez, S. W. of Krakatoa, is beyond the 40° line, or very nearly 3000 miles away.

The account given by Mr. James Wallis, Chief Officer of Police at Rodriguez, is in these words :

“On Sunday, the 26th, the weather was stormy, with heavy rain and squalls ; the wind was from S. E., blowing with a force of from 7 to 10, Beaufort scale. Several times during the night (26th–27th) reports were heard coming from the eastward, like the distant roars of heavy guns. These reports continued at intervals of between three and four hours until 3 P. M. on the 27th, and the last two were heard in the directions of Oyster Bay and Port Mathurie (Mathurin ?).”

Capt. Wharton, R. N., comes to the conclusion that the sea disturbance was probably composed of two descriptions of waves ; long waves, which alone were marked by the automatic gauges, and came about every hour ; and short waves at irregular intervals, the speed of both being about the same. The velocities varied, according to the depth of the sea and the obstacles offered to the passage of the wave by intervening islands, shoals, reefs, and headlands. Observations are tabulated from 48 stations, 37 of them provided with self-acting gauges. The lowest rate recorded was 39 geog. miles an hour at Soerabaya, 465 geog. miles from Krakatoa. Only three other records show a rate below 50 miles an hour, and in much the largest number the speed was consid-



erably beyond 300 miles. For Colon the calculation gives 606, and for Honolulu 770; but Captain Wharton is satisfied that the disturbances noted in the Pacific, as well as at Colon and in New Zealand, had no connection or almost none with Krakatoa.

The optical phenomena caused by the eruption did not entirely fade away until early in 1886.

These appearances were unquestionably due to the action of a haze, composed of dust and vapors mixed, or of dust alone, from the volcano. Many similar instances have been known; and on pp. 384-401 of the *Report* the Hon. Rollo Russell presents a list of analogous glow phenomena, associated with volcanic eruptions, and recorded between the years 1500 and 1886. Of these notices there are more than ninety.\*

To the many descriptions of the Krakatoa sunsets already published may be added the following, taken by *Nature*, of February 21, from Prjeválsky's "Fourth Journey to Central Asia:" "After a bright day which is here (in the Gobi) the usual state of the weather during the winter, light cirrus and cirro-stratus clouds appeared in the west, just before sunset, or immediately after. Probably they were floating all day long in the upper strata of the atmosphere, but became visible when the sun went below the horizon. Immediately after that, the whole of the western part of the sky became lighted by a bright cream light, which soon acquired a violet colour in the upper parts with stripes of shadows. At the same time the shadows of the night rose in the

---

\* Gen. J. Watts de Peyster has found in the *Literary Miscellany and British Review* for 1789 Berthelot's account of the strange skies seen after the eruption of Skaptar Jökull in 1783.

east, dark lilac in the lower parts, and violet in the upper parts. The violet colour vanished by and by in the west, and a segment of bright orange appeared close by the horizon, on a cream back-ground. Sometimes it acquired a light red colour, but sometimes it became bright red or even blood-red. In the meantime the lilac colour disappeared in the east, and all the sky became of a gray-lilac colour. Amidst the changing colours in the west, Venus glowed like a diamond descending beneath the horizon at the time when the twilight, which lasted for about one hour and a half, came to an end. During nearly all that time the glow in the west was casting shadows, and all objects in the desert appeared in a fantastic light. The sunrise was accompanied by the same phenomena, but in a reverse order: sometimes the morning twilight began with the appearance of a blood-red colour. At full noon the phenomena were less striking, and in the atmosphere of the Northern Ala-shan, which is charged with dust, we saw them less often than in the Central and Northern Gobi."

The *Report* is thoroughly well done and admirably illustrated; but why is Cumaná regularly printed *Cumaña*?

*International Polar Expedition. Report of the Proceedings of the United States Expedition to Lady Franklin Bay, Grinnell Land, by Adolphus W. Greely, First Lieutenant, Fifth Cavalry, Acting Signal Officer and Assistant, Commanding the Expedition. 4to. Vols. 1 and 2, Washington, 1888.*

This work is published by authority of the House of Representatives (the Senate concurring), and must,

therefore, be regarded as the official, definitive Report of the expedition to Lady Franklin Bay.

Leaving out the details of various physical observations, the net result of the expedition was the attainment by Lieut. Lockwood, in Lat.  $83^{\circ} 24'$  N., Long.  $40^{\circ} 46'$  W., of the highest latitude ever yet reached. This gives a kind of title to distinction and to remembrance.

For the conduct of the expedition, its incidents and the life led by those who belonged to it, as all these are here described, the less said the better. The rumors of strange and fearful things done by the men of the party may be passed over ; but the record published by the commander calls for a word or two. He has survived to tell his own story of his relations with the rest, and the men who never returned from the wilderness have no one to speak for them. This is a misfortune for their memory, and, possibly, a greater misfortune for their commander.

To name but two of them, Private Henry and Dr. Pavy, if they were alive, might have something to say for themselves, and Gen. Greely might find it proper to correct or to modify what he has printed concerning them. Henry seems to have been alone in the world, but Octave Pavy was not without friends. He is remembered by all those who knew him as not more remarkable for his great intelligence and his accomplishments than for his manliness and his honorable conduct.

Gen. Greely's last word about the dead man is that he was a Bohemian. The word is easily written, but it is not always used in a definite sense. The Chief Signal Officer undoubtedly means to say that Pavy was not a

martinet ; and this may be admitted. One statement must be given in the author's own words : " The most unfortunate experience of the month for me was the detection, on December 3, of Dr. Pavy purloining the extra food of Sergeant Elison (*Pavy's patient*). The detection occurred when the party were asleep and in total darkness, and Dr. Pavy was ignorant that I knew of his action." *Report, Vol. 1, p. 74.*

The human infirmities, exasperated by ill-health and privation and the incessant fret of temper under trying conditions, will account for much ; but this story is not to be believed. The charitable explanation of it is that Gen. Greely, himself a sick man at the time, took the figments of a heated brain for facts. It is none the less clear that his papers ought to have been submitted to careful criticism and selection before it was thought proper to publish them in any form under the authority of the Government.

*The National Geographic Magazine, Vol. 1, No. 1.*

*Washington, 1888.*

The Washington Society has made an excellent beginning. This first publication is very well printed and illustrated, and the articles, six in number, are all full of interest. President Hubbard leads with an Introductory Address that covers a wide field, and may be called revolutionary in character. It gives a shock to old associations to meet Cyrene on the Nile, exactly under the Tropic, and the allusion a little farther on to the law of Matthews is a trifle dim, for there does not seem to be, at first sight, any direct connection between the fecund,

ity of fish and a Justice of the Supreme Court; but all men do not see things in the same way.

Prof. Davis's article on "Geographic Methods in Geologic Investigation" is illustrated, in a sense, by Mr. McGee's paper on the "Classification of Geographic Forms by Genesis," though the ideas of the latter suffer under the weight of his vocabulary. In one instance, at least, on p. 36, he has invented a new term: *roches de moutonnées*.

Gen. Greely and Prof. Everett Hayden give the history of the great storm, March 11-14, 1888, with four colored charts, showing the meteorological conditions for each day at noon, Greenwich mean time, one Track Chart, and a Barometer Diagram.

Mr. Herbert B. Ogden reviews the work of the Coast Survey from its creation in 1807, and Mr. Henry Gannett's account of the Survey and Map of Massachusetts closes the number.

Rarely does a new Association show so much promise.

*Princeton College Bulletin, Vol. 1, No. 1, January, 1889. Princeton, New Jersey.*

The *Princeton College Bulletin* is edited by the President and Members of the Faculty, and will deal editorially and through signed articles with the educational questions that affect the general interest. This first number gives, besides the President's address at the opening of the College in September, 1888, a number of notes on literary and scientific subjects. One of these, on p. 23, calls for more ample information. Prof. Frothingham, it is said, has found in the writings of James, Bishop of Edessa (c. 700 A. D.), a passage which

evidently refers to the continent of America. It would be a pleasure to see this passage, if it is couched in language not unworthy of the Episcopal dignity.

*Eskimo of Hudson's Strait. By F. F. Payne. Toronto: 1889. Pamphlet, 8vo.*

Mr. Payne's pamphlet is an Extract from the Proceedings of the Canadian Institute, and gives the result of his observations during a residence of thirteen months among the Eskimo, and principally those at Cape Prince of Wales.

Their way of life is regular. Two meals a day are taken, one upon rising in the morning, the other just before retiring, and Mr. Payne thinks they waste nothing. They steal with great adroitness, and like nothing better than to find a cache some one has made, when they all go in and eat up the food. Sometimes they return stolen articles, but always expect pay for their honesty and are indignant if it is refused. Cleanliness they hardly know, but they enjoy washing their faces with soap in the warmer weather as a kind of play. They smoke whenever they can, and prize tobacco very highly.

They are of a merry disposition and are always ready to laugh. At the same time, their amusements are few; throwing the harpoon at a mark, wrestling and running, and a game something like a tilting-match. In a snow-house built for the purpose, with a central pillar, an ivory ring is suspended from the roof, and the men try to put their spears through it as they walk quickly round the pillar. During Mr. Payne's stay, foot-ball was introduced, the ball being a walrus-bladder covered with leather. Men and women took part in the game,

the latter with their children on their backs. The girls have their dolls, made of sticks, and play at keeping-house and giving dolls' parties.

The Eskimo has generally but one wife and seems to be careful in providing for his family. A curious custom on the Strait is that if a married man is considered to be worthy of death for some offence, the one who accepts the office of executioner assumes the care of the criminal's wife and children. Ugaluk, one of Mr. Payne's men, had a second wife who had come to him in this way.

The Eskimo believe in a heaven and a hell, the former the abode of those who tell the truth in this life, while the liars are sent to hell. Heaven is where the sky and earth meet, to the southward, a place where there is no snow and plenty to eat, without any work; but in hell it is very cold, with continual snow, and hard work. Ugaluk said that his people offered up prayers, but Mr. Payne never saw this done. The dead are buried along the coast, a favorite place being an island to which the foxes and wolves have no access. Monuments, sometimes ten feet high, are built over the graves, and offerings are made to the departed.

Mr. Payne found two cannons on the shore near Cape Prince of Wales, and in them a number of bullets, shot and rubbish, put there, he was told, for the use of the spirits.

*The Unknown Horn of Africa. An Exploration from Berbera to the Leopard River. By F. L. James, M.A., F.R.G.S. With Additions by J Godfrey Thrupp, M.R.C.S. Map and Illustrations. London, 1888.*

Mr. James's party, composed of 10 Europeans and



20 Somalis, started from Berbera, the Somali port on the Gulf of Aden, at the end of November, 1884, for the interior. The farthest point reached was a little beyond Barri, about 350 miles from Berbera, in a direction W. of S. The return was along a line, nowhere more than 65 miles to the W. of the first.

The objects of the Expedition were principally sport and science, with an eye to commerce in the future, Mr. James expressing the hope in his preface that the direct British influence, "if not territory," may at no distant date extend from the land he and his companions were the first to explore to the present southern boundary of the British East African Company's Country. If the Somalis offer no objection to the fruition of this hope, other men may well be satisfied.

The journey is described in a lively and entertaining style. Some time before starting Mr. James met Sir Richard Burton and quoted to him the advice given by M. Antoine d'Abbadie, a most experienced East African traveller, in the words: "Feel your way, but never tell where you are going." "Do nothing of the kind," said Burton, in his direct, if not high-bred English: "Give out your goal at once, and don't attempt to dodge niggers." Mr. James followed Burton's rule and thinks well of it. The other rule may have been as good, but the anecdote is worth remembering as an illustration of the value of experience.

Each Somali, when he signed the contract for the journey, bound himself by oath *to divorce his wife*, if he failed to keep his engagement, and Mr. James was assured that this tremendous obligation would hold a

Somali when nothing else would. The men behaved fairly well throughout the journey.

Things were less pleasant with the native tribes. These were all eager to turn an honest penny by begging, or, if that failed, by threatening violence ; but vigilance and firmness carried the travellers through with safety. The medicine-chest was also a great blessing, for the Somalis will take anything in the way of drugs.

Mr. James saw quite enough to convince him that the explorer in Somali-land should be always on his guard.

The natives, he believes, are not to be trusted ; but he does not report the native opinion of the Europeans. He and his party must have been wonderful to men who knew nothing of tobacco and fire-arms.

For about 70 miles, as far as Burao, the road was an ascent to the edge of a table-land, the Haud, which affords no water in the winter season for a distance of more than 200 miles. The camels travelled this long way in thirteen days, without drinking a drop of water until they reached the wells of Gerloguby. These wells were dug in the solid rock, no one knows when or by whom ; and beyond them the country was more promising.

At Barri, on the Leopard River (Webbe Shebeyli), the land was covered with flocks and herds, and the trees were magnificent.

The people were no longer Somalis, but a race of negro type, called Adone, and described as diabolically ugly, and only the rulers were of Somali blood. Mr. James accepts the story told him that the Somali conquerors were driven out, but that some of them were

allowed to remain and rule the country ; an arrangement which implies magnanimity on both sides, or extreme innocence on one.

The illustrations, some of them beautifully colored, and the Appendix with its very full descriptions of animal and plant life, add greatly to the value of the work.

*Christophe Colomb, Français, Corse et Calvais, Etude Historique sur la Patrie du Grand Amiral de l' Océan, par l' Abbé J. Peretti, de Muro. 8vo.*

*Paris et Bastia, 1888.*

The Abbé Peretti says in his preface that he believes his readers will be convinced :

"1. That no historical question is surrounded with more uncertainty and *mystery* than the question of the origin of Christopher Columbus ;

2. That this mystery constitutes a relative proof in favor of Calvi as his birthplace, a spot which, furthermore, has the *strongest probabilities* on its side ;

3. That the unconscious testimony of Giustiniani, of Foglietta and of Casoni, does away with all uncertainty on this point, and proves, with all the clearness that can be asked for in history, that Christopher was a Corsican and a native of Calvi."

*Credo quia absurdum.*—The readers who are convinced of the first proposition must be confounded by the last ; and if, as the second proposition maintains, the mystery is a proof, what does any man want with probabilities or unconscious testimony ?

The Abbé has but lately become a citizen of Calvi, and the zeal of his house hath eaten him up.

There are 500 pages in his book, and much fine writ-

ing, but there is not one argument that will bear examination. He puts his own meaning on allusions and obscure references, and this he has a right to do; but his reader has also a right to reject his meaning.

Mr. Peretti's conclusion bears unconscious testimony to his lack of appreciation of what constitutes evidence: "In laying down the pen, we believe that there is but one way to dispute the claim of the little city of Calvi to the honour of having given birth to Christopher Columbus; and that is to produce the registration of his birth, or *something equivalent*, as we ourselves have done."

We shall know much more about Columbus within the next few years; and, since it is certain that a man must be born somewhere, it is quite possible that evidence may be brought to light to prove that the great Admiral was born in Elba, or in Corsica, or, perhaps in Paris.

Whatever may have been his birthplace, men will continue to believe that he was an Italian, in spite of the book on which the Abbé Peretti has wasted so much time and labor.

#### TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

AMSTERDAM.—*Kon. Nederlandsch Aardrijkskundig Genootschap, Tijdschrift.*

The Island of Urk (in the Zuyder Zee)—The Boundary Between the Netherlands Territory in Borneo and that of the North Borneo Company—Communications relating to the Scientific Examination of the Key Islands and of Flores—A Letter of Van der Kellen's on Gambos (Angola) and Its Inhabitants—Dr.

H. F. C. Ten Kate's Letter on His Visit to New Mexico and Mexico.

BERLIN.—*Gesellschaft für Erdkunde, Verhandlungen der.*

Land and People in Ancient and Modern Egypt—  
The Settlements and the Trade of the Morea  
—A Festival of the Dead among the Bororó  
Indians—The Surface Formations of the Congo  
Basin.

*Mittheilungen von Forschungsreisenden und Gelehrten  
aus den Deutschen Schutzgebieten.*

Reports from the Togo Country : by Von François,  
Puttkamer, Wolf and others ; Measurements  
of Elevations by the Wolf Expedition, Meteorological  
Observations at Adadó (Bismarckburg, 220 miles from the coast and 2330 feet  
above the sea)—Reports from the Kamerun  
Region, by Zintgraff, Tappenbeck, Weissenborn and Braun, on the Cultivation of European  
Vegetables, the Zoological Results, etc.  
—Journey in the Back Country of Togo-Land ;  
Measurements of Elevation and Determinations  
of Latitude—Zintgraff's Expedition to the  
Source of the Calabar, or Grand River—Remarks  
on the Map of the Route from Barombi  
Station to Banyang (Kamerun)—Kund's Expedition—  
Report of Meyer and Baumann in Usambara (East Africa).

*Deutsche Kolonialzeitung.*

Events in German East Africa—The Emin-Pasha  
Movement—Kilua in 1506–1508—The Blockade  
of the East-African Coast—African Slav-

ery and the Arab Rule—Santa Fé in the Argentine Republic—The Rescue of the *Employés* of Lewa—The Apostolic Vicariate of the Nyanza Lake—The Relations of the Togo Region—German Vitu - Land—German and English Settlements—The Debate in the Reichstag—The Slave Trade in the Red Sea—A Practical Glance at Quinine—The Troubles in Samoa—German Planters for the German Colonies—An "Accession Treaty" with Zanzibar—Karema (on the Eastern Shore of Lake Tanganika)—Bolivia—Against the Slave Trade—Prohibitory Duties on the Niger—Documents Relating to the Rising in East Africa—Right Across Africa under the German Flag.

BOSTON.—*Appalachia.*

Ypsilon Peak (Colorado)—Two in the Alpine Pastures — Mountains Near New Zealand Notch—The Crater of Mt. Misery, St. Kitts—On Snow-Shoes at Jackson—An Exploration in the Pilot Range—Some Adirondack Paths.

BRUSSELS.—*Société Royale Belge de Géographie, Bulletin.*

A Scientific Expedition to the Caucasus—An Excursion in Campine (region between Antwerp and Limburg)—Colonization and Emigration.

*Le Mouvement Géographique.*

The Belgian Enterprises on the Congo—The Conquest of the Congo: the Story of Ten Years, 1878-1888—The Stanley Expedition—The News From Stanley—The Problem of the Lukuga—The Question of the Lomami—The

Ivory Trade—Count Teleki's Explorations in Africa—The Congo Railroad.

BUENOS AIRES.—*Instituto Geográfico Argentino, Boletín.*

Exploration of Patagonia—The Map and Atlas of the Argentine Republic—Expedition to the Province of Matto Grosso (sent out by the Geographical Society of Rio de Janeiro in May, 1888).

EDINBURGH.—*Scottish Geographical Magazine.*

Sketch of the History of Telegraphic Communication between the United Kingdom and India—Journey in the Vice-Consular District of Chiengmai (in the Lao country, 400 miles N. N. W. of Bangkok)—The Inland Ice of Greenland—Obituary (Jacques de Brazza)—Note on the Karun River, Persia—The Andamans and Andamanese—Preliminary Note on the Geological Structure of the Sindang-Barang District, on the South Coast of Java—The Transvaal, or South African Republic—The Philippine Islands.

GOTHA.—*Petermanns Mittheilungen.*

On the Chalk Region near the Pyramids of Gizeh (Dr. Schweinfurth)—General Prjevalsky's Fourth Journey of Exploration in Central Asia—The Formation of Transverse Valleys—The Mean Height of the Land and the Mean Depth of the Sea—The Geographical Distribution of Mean Wind-Velocity in the United States—The Universal Adoption of the Gregorian Calendar—The Division of River Regions by the Principal Water-Shed of the Earth—Clima-



tological Observations in Costa Rica up to 1888—Ratios of Temperature on the North-eastern Coast of Labrador—Usambara.

LONDON.—*Royal Geographical Society, Proceedings.*

The Niger Delta—The Key, or Ké, Islands (S. of Dutch New Guinea)—A Note on the Conservative Action of Glaciers—A Journey to Southern Morocco and the Atlas Mountains—A Visit to Sheshouan (60 miles S. of Tetuan, Morocco)—A Journey from British Honduras to Santa Cruz, Yucatan—Nilometers—Journey from Natal to Bihé and Benguella, and thence across the Central Plateau of Africa to the Sources of the Zambesi and Congo—Further Exploration in the Regions Bordering upon the Papuan Gulf—Note on the Origin and Orthography of River Names in Further India.

*Nature.*

Prjevalsky's Fourth Journey to Central Asia—The Coral Reefs of the Peninsula of Sinai—How Rain is Formed—The Earthquake at Ban-dai-San, Japan—The Law of Storms in China—A Volcanic Sea-Wave (N. of New Guinea, March 13, 1888)—The Earthquake at Edinburgh (Jany. 18, 1889)—The Report of the Krakatao Committee of the Royal Society.

MADRID.—*Revista de Geografia Comercial.*

Spanish Immigration into the Philippines—The Island of Paragua—The Western Sahara—Fighig and the Moorish-Algerian Frontier—Spain in the Gulf of Guinea—The Importance

and the Future of the Mariana (Ladrones) Islands—Commerce and Caravans in the Western Sahara—The Congo Free State—Foreign Commerce of Spain—Geographers in the Ministerial Departments—Questions Concerning the Philippines—The Province of Vizcaya—Blockade of the East African Coast—Spanish and Portuguese Wines in Germany—Museum of Agriculture and Forestry in Lisbon—Chambers of Commerce—The Treasures of the Incas—The Muni Question (between Spain and France concerning territory on the African coast near the Gaboon)—The Province of Coruña—The Trade of Japan with Spain and the Philippines.

MANCHESTER.—*Manchester Geographical Society, Journal of the.*

A Recent Journey from Lamu to Golbanti in the Galla Country—The Heart of Europe as viewed from a Railway Train, with Notes of a Visit to Constantinople and Other Places in the Ottoman Empire—Victoria—Water Supply to Large Towns—The Arabs in Central Africa—Notes on the Nyassa Region of East Africa—Correspondence—Portugal and Africa—Manchuria.

MILAN.—*L'Esplorazione Commerciale.*

Lessons in Commercial Geography—Emin Pasha and Capt. Casati—The Western Sahara—Correspondence: S. Paulo (Brazil) and Suez—Santa Fé (Argentine Republic) and Its First Census—The Bamboo—Roman Letter—Tu-

nis—The Future of the Italian Lemon in America—Colonial Massowah—African Notes—Trade in Liquors in Northern Africa—Principal Products of Central Africa.

NAPLES.—*Società Africana d'Italia, Bollettino.*

African Questions—Slaves in Africa—The Anti-Slavery Committees—Africa at War—A Visit to Lavigerie—Emin Pasha and Capt. Casati.

NEW YORK.—*Science.*

French Kongo—The Development of Commerce on the Kongo—Africa, Its Past and Future.

PARIS.—*Société de Géographie, Bulletin.*

Report made the 15th April, 1888, on the Competition for the Annual Prize—Journey across the Western Sahara and Southern Morocco, by Camille Douls—New Researches on the Origin of the name of America (Jules Marcou)—Gen. J. T. Walker's Letter on Dutreuil de Rhins's Notice of Tibet, and Reply of M. Dutreuil de Rhins—The Geographical Distribution and Density of Population in France—The Euphrates Valley Railway—The Island of Réunion.

*Compte Rendu.*

Ascent of Mt. Ararat—The Dome of the Rock (at Jerusalem)—François Bernier (the Oriental Traveller)—Journey to the Salt Mines of Iletzk (40 miles S. S. W. of Orenburg)—Semionoff's Journey in Turkestan—The River Whémé (the boundary between Porto Novo and Dahomey)—The Lake Liba Country—Identification of the Hydrographical Basin

of Central Tunisia with that of the ancient Triton—Map of Cambodia and Dictionary of the Khmer Language—Journey to Bambook and Foota-Jallon—The Origin of the name Sfax—The Hemenway Archæological Expedition—A Manuscript of D'Alembert's—The Prime Meridian (of Jerusalem)—M. Varat in Corea—Capt. Binger in the Western Sudan—Itineraries of the Congo region—Climate and Races of Western Africa (by M. Paul Barret)—France under the Valois and the first Bourbons—Map of the Caucasus—The Transcaspian Railway—The Map of Madagascar—Alsace, the Country and Its Inhabitants—The Dynamometer of the *Hirondelle* (the Prince of Monaco's Yacht.)

RIO DE JANEIRO.—*Revista do Observatorio.*

The Climatology of Brazil.

ROME.—*Società Geografica Italiana, Bollettino.*

Excursion into the Gimma Country (S. Abyssinia)

—Volcanoes and Earthquakes in the Isthmian Region of Central America—Letter from Harar—Six Months in Madagascar—Emin Pasha and Capt. Casati—Barret's History of the Western Sudan—On the Meaning of the Word *Pendenza* (slope)—A Lunar Rainbow and Fata Morgana—Galli's Map of Italy—From Cucuhy to Manaos—Explorations of Borelli (in Abyssinia)—An Excursion in Basutoland—Roblet's Map of Madagascar—The Province of S. Paulo (Brazil)—Studies for the Columbus Collection (now making for the year 1892).

TURIN.—*Cosmos*.

Report of the Italian Vice-Consul at Montevideo on the Condition of Uruguay—Nachtigal's Travels in the Sahara and the Sudan—The Second Expedition of von den Steinen to the Xingu—Younghusband's Journey from Manchuria to Kashmir—From Assab Bay to Shoa.

VIENNA.—*Kais. Königl. Geographischen Gesellschaft, Mittheilungen der*.

On the Regularly Recurring Variations of Surface in Lakes and Enclosed Seas—The Climatic Conditions of Silesia—The Religious Conceptions of the Ilocans (in the Island of Luzon)—Remarks on the Map of the Middle Congo—Annam and French Cochinchina—A Description of the Aurora Borealis from the 12th or 13th Century.

*Deutsche Rundschau für Geographie und Statistik*.

Mountains and Rivers of the Lands in the South of the Hawash—Athens—The Arabs in Central Africa—Contributions to the History of the Development of Cartography—Conversations with Stanley (by Paolo Mantegazza)—Trade-Routes for the Commerce of the World—The Bosnian Dwelling—Settlements of the Germans in the Country described by Tacitus in his *Germania*—The German Language in Southern Brazil.

WASHINGTON.—*National Geographic Magazine*.

Introductory Address by the President—Geographic Methods in Geologic Investigation—Classification of Geographic Forms by Genesis

—The Great Storm of March 11 to 14, 1888—  
The Survey of the Coast — The Survey and  
Map of Massachusetts.

## WASHINGTON LETTER.

---

WASHINGTON, MARCH 15, 1889.

THE CENSUS OF THE UNITED STATES.—The Act providing for the eleventh Census (1890), passed during the last hours of the 50th Congress, seems to create a *permanent* office in the Department of the Interior, to be denominated the Census Office. A chief officer is to be appointed by the President of the United States, to be called the Superintendent of Census, whose duty it shall be to superintend and direct the taking of the eleventh Census, "*and to perform such other duties*" as may be required by law. The annual salary of this office is fixed at \$6,000.

The Act prescribes and limits the scope of the next Census to an enumeration of the population; social statistics relating to the population; statistics relating to the products of manufactories; agricultural and mining industries; mortality and vital statistics; valuations and public indebtedness; recorded indebtedness of private corporations and individuals; statistics relating to railroad corporations; incorporated express, telegraph and insurance companies; and, finally, a list of the names, organizations, and length of service of surviving soldiers, sailors and marines in the War of the Rebellion, and the widows of such soldiers, sailors and marines.

Compared with the subjects enumerated in the Census of 1880, this arrangement would seem to eliminate the



following: forestry, ship-building, newspapers, petroleum, coke, building-stones, precious metals, water-power, wages, strikes, defective and dependent classes, power and machinery employed in manufactures, ice industry; and to *add* insurance statistics and a list of surviving soldiers, sailors and marines (and their widows) of the late war. It is also provided that there shall be an inquiry as to the number of negroes, mulattoes, quadroons and octoroons; and from official sources information relating to animals not on farms. The topics in the last Census which are to be omitted in the new were most of them ably and exhaustively treated; so that, with the means within the reach of almost any one, they can be applied to conditions of later date. The *new* matter therefore introduced into the eleventh Census may be considered an extension of the great Census of 1880. Exclusive of printing, engraving and binding, the cost of the Census is limited to \$6,000,000, of which amount \$1,000,000 are appropriated by the present Act.

A descriptive table of former census publications will be found of interest:

Census of.	No. of Vols.	When Published.	Title of Volume.
1790	1	1792.	1. Return of the whole number of persons within the several districts of the United States.
1800	1	1801.	1. Same title as last.
1810	2	Not stated.	1. Aggregate amount of each description of persons within the United States, etc.
		1813.	2. A series of tables of the several branches of American manufactures, exhibiting them in every county of the Union, so far as they are returned in the reports of the marshals and of the secretaries of the territories and of their respective assistants in the autumn of the year 1810, etc.

- |      |    |            |  |
|------|----|------------|--|
| 1820 | 2  | 1821.      | 1. Census for 1820, etc.   |
|      |    | 1823.      | 2. Digest of accounts of manufacturing establishments, etc.  |
| 1830 | 1  | 1832.      | 1. Fifth census or enumeration of the inhabitants of the United States.  |
| 1840 | 4  | 1841.      | 1. Compendium of the enumeration of the inhabitants of the United States, etc.   |
|      |    | 1841.      | 2. Sixth census or enumeration of the inhabitants of the United States.  |
|      |    | 1841.      | 3. Statistics of the United States, etc.   |
|      |    | Not given. | 4. Census of Pensioners for Revolutionary and military services, with their names, ages, and places of residence, etc. |
| 1850 | 4  | 1853.      | 1. The seventh census of the United States.  |
|      |    | 1854.      | 2. Statistical view of the United States.  |
|      |    | 1855.      | 3. Mortality statistics of the seventh census.   |
|      |    | 1859.      | 4. Digest of the statistics of manufactures.   |
| 1860 | 4  | 1864.      | 1. Population.   |
|      |    | 1864.      | 2. Agriculture.  |
|      |    | 1865.      | 3. Manufactures.   |
|      |    | 1866.      | 4. Mortality and miscellaneous statistics.   |
| 1870 | 4  | 1872.      | 1. Compendium.   |
|      |    | 1872.      | 2. Population and social statistics.   |
|      |    | 1872.      | 3. Vital statistics.   |
|      |    | 1872.      | 4. Wealth and industry.  |
| 1880 | 24 | 1883.      | 1. Statistics of population.   |
|      |    | 1883.      | 2. Statistics of manufactures.   |
|      |    | 1883.      | 3. Statistics of agriculture.  |
|      |    | 1883.      | 4. Agencies of transportation.   |
|      |    | 1884.      | 5. Cotton production in the U. S., part 1.   |
|      |    | 1884.      | 6. Cotton production in the U. S., part 2.   |
|      |    | 1884.      | 7. Valuation, taxation and public indebtedness.  |
|      |    | 1884.      | 8. Newspapers, Alaska, Ship-building.  |
|      |    | 1884.      | 9. Forest trees of N. America (with an atlas).   |
|      |    | 1884.      | 10. Petroleum, coke, and building-stones.  |
|      |    | 1885.      | 11. Mortality and vital statistics, part 1.  |
|      |    | 1886.      | 12. Mortality and vital statistics, part 2.  |
|      |    | 1885.      | 13. Statistics and technology of precious metals.  |
|      |    | 1885.      | 14. Mining laws of the United States.  |
|      |    | 1886.      | 15. Mining industries of the United States.  |
|      |    | 1885.      | 16. Water power of the United States, part 1.  |
|      |    | 1887.      | 17. Water power of the United States, part 2.  |

- 1886. 18. Social statistics of cities, part 1.
- 1887. 19. Social statistics of cities, part 2.
- 1886. 20. Wages, prices of necessities of life, trade societies, strikes and lockouts.
- 1888. 21. Defective, dependent and delinquent classes.
- 1888. 22. Power and machinery employed in manufactures and the ice industry.
- 1883. 23. Compendium, part 1.
- 1883. 24. Compendium, part 2.

It will be observed that many volumes (fully half) of the Census of 1880 were published five, six, seven and even eight years after date. This delay was not so much the fault of the collaborators as of Congress in dealing out insufficient appropriations to pay for the printing. On two occasions the work absolutely came to a standstill, although the material was in the printers' hands. Let us hope that the results of the eleventh Census will be fully known before the dawn of 1900.

ALASKA.—The expeditions sent out by the United States Coast and Geodetic Survey for a number of years past to survey the coasts and waters of Alaska have made contributions of much value to our knowledge of the country, the resources of which are but just beginning to be developed.\* A steamer for surveying purposes has been sent to south-eastern Alaska during 1885, 1886, 1887 and 1888. As one result of these and previous surveys, forty-five charts of Alaskan harbors have been published.

Prof. George Davidson,† who for more than twenty years has made Alaska and its vicinity the subject of very close study, urges the necessity of liberal appropriations "for the purpose of charting the dangers of the

---

\* F. M. Thorn, in Bulletin No. 2, U. S. Coast and Geodetic Survey.

† Bulletin No. 4, U. S. Coast and Geodetic Survey.

wild and rocky coasts of that region, to determine the currents along an intricate and curving seaboard, to determine geographical positions, to survey the approaches to all harbors of refuge, to suggest proper aids to navigation, and to determine the limits and depths of the fishing banks. He has ascertained that the cod fishing banks of Alaska are *four times the area of those in the region of Newfoundland*. The eastern part of Behring Sea is a "mighty reservoir of cod," the area within the limits of fifty fathoms depth being no less than 18,000 square miles. In this sea, fishing must be done as it is done off Newfoundland—without harbors of refuge but in much less depth of water. The fishing banks along the south coast of Alaska bordering the Gulf of Alaska, and south of part of the Aleutian chain will add not less than 45,000 square miles, making a total of 63,000 square miles, with an average depth of fifty fathoms of water. If the fishing limits are extended to 100 fathoms, the area of the fishing banks will be increased to not less than 100,000 square miles.

The salmon throughout Alaska are much more numerous than in the waters of California, Oregon and Washington. In some localities the salmon are crowded so thick that the progress of a boat is impeded by them, and in case of a sudden south-east storm the fish are driven on the beach in innumerable quantities. A Russian navigator asserted, in 1867, that "under such circumstances he had seen the beach strewn two and three feet deep with stranded salmon." Mr. Davidson, from personal experience, pronounces the Chilkah salmon the highest colored and finest flavored on the Pacific coast. "There is no such field on this earth as these Alaska

waters for this fishing development ;" and he asserts that Alaska is an inexhaustible store-house of wealth in its fisheries, forests and minerals.

COLUMBIA RIVER.—A description and map of the Columbia River from the Dalles to Celilo accompanies a recent Report of the Board of Engineers constituted by the Secretary of War to examine the obstructions to navigation in that river. It is stated that the Columbia River is navigable for deep sea vessels for a distance of about 100 miles from its mouth. The next stretch of 100 miles, interrupted by the Cascades Rapids affords boat navigation with a minimum depth of eight feet. Above Celilo the low water depth on bars is about four feet, and the river is navigable to Priest's Rapids, a distance of nearly 200 miles. The obstruction of Priest's Rapids puts an end to navigation, but it is almost certain that this obstruction is susceptible of improvement for navigation. It is the announced policy of the Oregon Railway and Navigation Company to run boats on the Clearwater, Middle Snake and Columbia River above Priest's Rapids as soon as regions along those parts of the rivers become settled.

The Board of Engineers recommend the construction of a single-track portage railway from Celilo to The Dalles.

At a recent hearing before a Committee of Congress, Dr. J. W. Powell made some interesting statements in regard to the development of his plans for the irrigation of the arid regions. Pointing on a map to a river in New Mexico known as the Jemes, which is an affluent of the Rio Grande, he remarked that it was called a creek below and a river above, nearer the sources ; and

he said that more than half, perhaps two-thirds, of all the rivers of the arid regions that head in the mountains run out into the desert plains or valleys, and are lost in the sand ; but all the rivers, even those which carry their waters to the sea, diminish very greatly from the point where they leave the mountains to the point where they reach more humid lands below.

Speaking of measurements he said : " We measure water by acre feet. This is something devised during the last season. It was found that people did not understand the ordinary terms of measurements, and so a new unit was devised, and it has come into use within the last five or six months through the technical journals and has been adopted by the people of the west. An "acre foot" of stationed water is an acre of water a foot deep. An acre foot of water will *on an average* in the United States irrigate for the season an acre of land. The storage reservoirs are to be made simply by constructing a dam. In reply to the question whether the Government should build the dams, he said his idea was that the Government should make the surveys, select the lands to be irrigated and the sites for reservoirs and canals, and reserve them so that they should not fall into the hands of individuals to be held for speculative purposes, and then let anybody who wants to, build the dams and canals. An acre of land irrigated is at once brought up from nothing to the value of thirty to two hundred dollars. There are eight States and Territories where agriculture is wholly dependent upon irrigation, and there are six other States and Territories chiefly dependent upon it.

Dr. Powell declined to increase his estimate of one

year's appropriation from \$350,000 to \$500,000, on the ground that he could not find the men to do the work.

Not the least among the benefits to be derived from this irrigation investigation is the stimulus and aid it affords to the topographical survey and the mapping of the Territories and States. It will shorten this great work by many years, for the reason that Congress is disposed to provide liberally for irrigation, while a recognition of the importance of topographical maps wins its way inch by inch.

SKY CHARTS.—The Government of the United States was represented at the Astro-Photographic Congress held at Paris about two years ago, when it was decided that the work of charting the sky by photographic process should be begun. A few of the Governments had pledged, in advance, their support of the plans to be agreed upon, and most of the others have since provided the necessary means. It was assumed that the part of this plan of astronomical photography assigned to the United States would devolve upon the Naval Observatory, and Congress has been asked to appropriate \$50,000 for buildings, instruments, mountings and material.

PRECIOUS METALS.—The gold product of the United States for 1888 is reported at 1,644,927 fine ounces, of the value of \$33,644,927, being an excess of \$175,000 over 1887. The silver product was 45,783,632 fine ounces, of the commercial value of about \$43,000,000, an increase of 4,515,328 fine ounces over 1887. In addition, about 10,000,000 ounces of silver were extracted from foreign ores and bullion. The average price of



silver was about 94c; the average bullion value of the dollar, 72.6. The estimated consumption of gold and silver in the industries during 1888 was: gold, \$14,600,000, silver, \$3,280,000.

ARGENTINE REPUBLIC.—The boundary question between Chili and the Argentine Government, according to late intelligence from Buenos Aires, still remains unsettled, but the negotiations for determining the line which divides the two countries are quietly proceeding within the stipulations of the 23d of July, 1881. The settlement of the limits controversy between the Argentine Republic and Brazil has been referred to a joint commission, which with a technical staff of assistants has been at work for more than a year in the exploration of the disputed territory in the Misiones. The only doubt which arose was in reference to the identity of the Rivers Santo Antonio and Iguazú, maintained by the Argentine commissioners and denied by the Brazilians; and it is thought that an understanding has now been reached on the subject.\* In regard to the boundary question between Bolivia and the Argentine Republic, nothing has been done during the past year, both governments maintaining the existing *status quo* in the most friendly manner.

\*The dictionaries on both sides support the Argentines. Saint-Adolphe's *Diccionario Geographico, etc., do Brazil* (Lopes de Moura's edition), describes the Santo-Antonio as follows: "A small river in the Province of S. Paulo. It rises near the source of the river Pepiri and unites with the river Curitiba, or Iguazú, 20 leagues above the falls of the Funil." Four leagues beyond this fall, the Iguazú empties into the Paraná.

Paz Soldan, in his *Diccionario Geog. Estadist. Nac. Argentino*, says of the Iguazú: "It is full and navigable as far as the famous Victoria Fall, which is among the highest in the world (197 feet). . . . It rises in the mountains of S. Paulo in Brazil, and forms the boundary with that country from the San Antonio mouth to the junction with the Paraná." (G.C.H.)

The Argentine Republic appears to be on the road to national prosperity. Political quiet pervades the country. Revolutions and attempts at revolutions are matters of the past. The guarantees of the Constitution having the sanction of the people, the laws are permitted to be peacefully executed. The new President, in his late message to the Argentine Congress, said: "My policy has been peace, toleration and conciliation; the fullest liberty for the expression of public opinion, and the free exercise of personal rights." The Government encourages immigration from Europe, the last Congress having voted 50,000 passages to be advanced to agriculturists and artisans intending to settle in the country. The Commissioner of Immigration is said to be having grand success in Europe with the poorer classes. The American Consul, however, entreats his countrymen not to try their fortunes there, "where everything is so different and so primitive compared with what they have enjoyed at home."

Government concessions have largely stimulated the construction of railroads in the Republic. Thirteen guaranteed roads represent a total length of 5770 miles, but numerous applications for new lines without such guarantees have lately been made.

The inter-provincial commerce of the country by river has increased from \$27,502,468 in 1881, to \$73,821,583 in 1887. Progress in agriculture is very marked. In several leading crops the surplus for export is advancing in rapid ratio, the shipments having increased from 145,224 tons in 1882, to 706,254 tons in 1887.

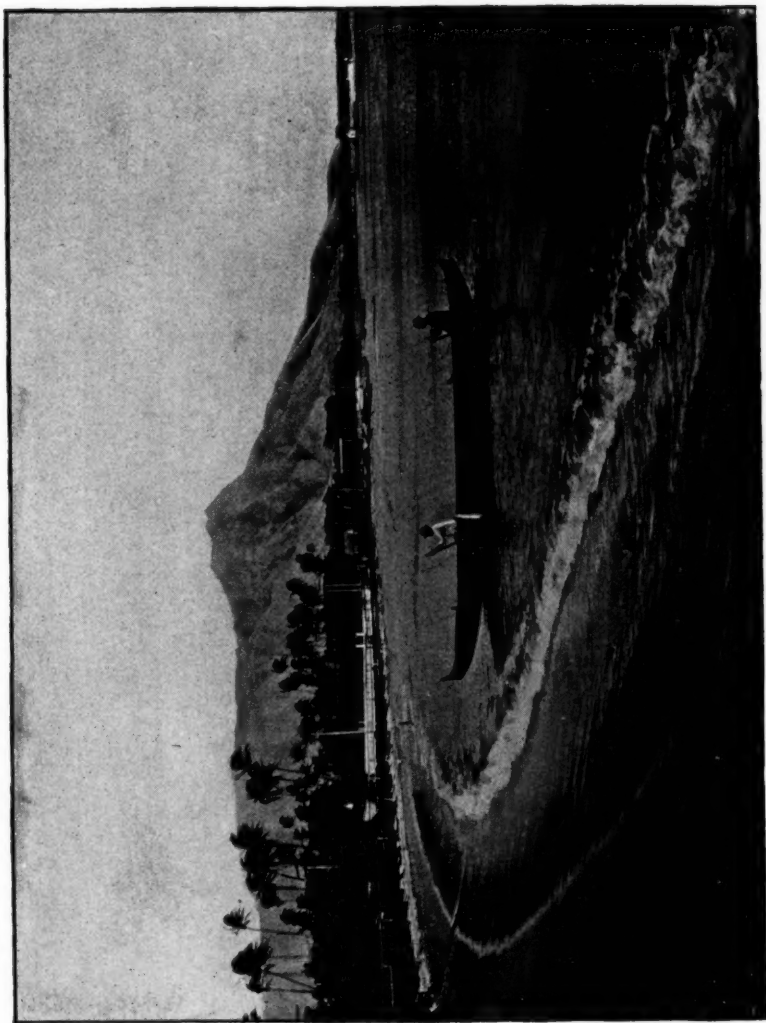
CHEROKEE TONGUE—The Director of the Bureau of Ethnology of the Smithsonian Institution has adopted

the conclusion of a number of the members of that Bureau, that the Cherokee language belongs to the Iroquoian stock. This has hitherto been considered an open question.

AMERICANS IN CHINA.—The total number of American citizens resident in China in 1888 was 1022, of which number 28 were diplomatic and consular, and 506 were missionaries.

TOBAGO.—The annexation of the island of Tobago to Trinidad took effect January 1, 1889.

H.



DIAMOND PT. OAHU, HAWAIIAN ISLANDS.